Coal Age

COAL AND TAXES.. p. 62

ONLY MINE CARS CAN GIVE YOU...

Constant Haulage

If your coal-haulage system 'goes out' all at once, your whole mine stops dead. Production is at a standstill. You can't cut or load your coal, because you have no place to put it.

That's why you need a complete mine car system, one you can always depend on. Your coal will never be 'marooned' at the face longer than a few minutes by a 'broken' mine car system.

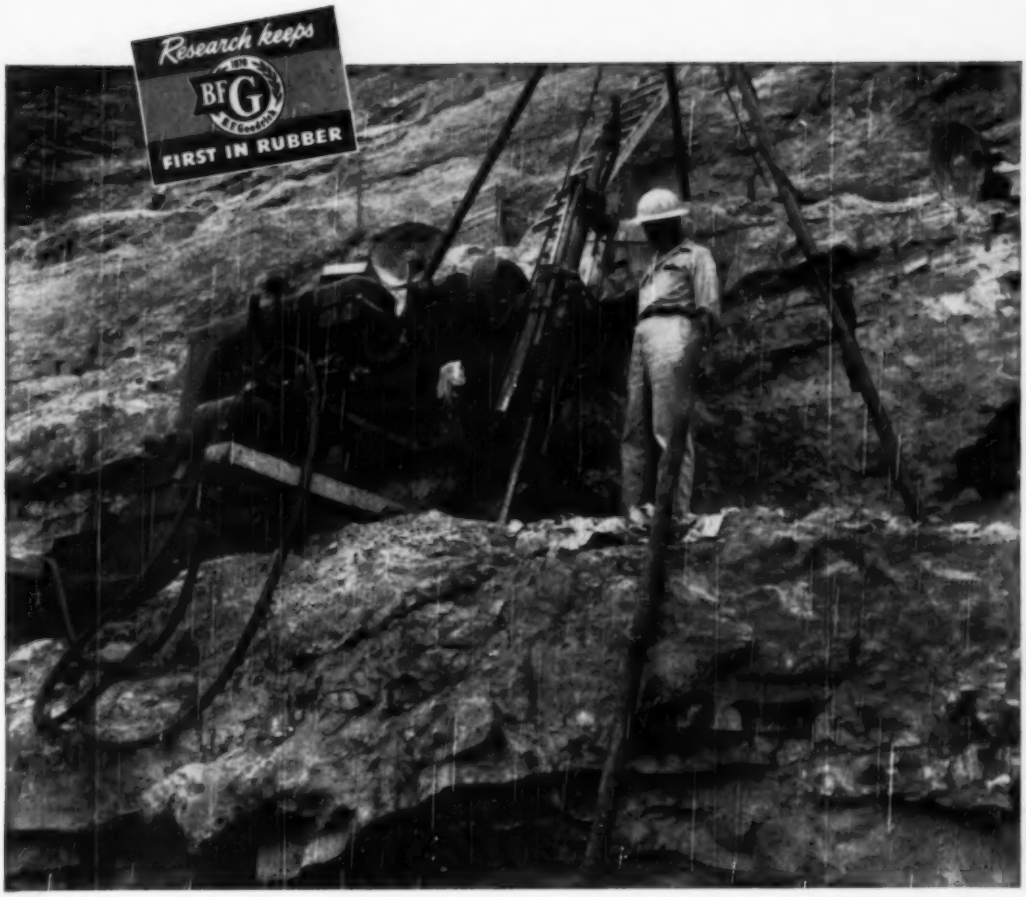
Of course, you have to figure other angles, too. So don't forget—mine cars are easier on maintenance costs, easier on repairs, and easier to arrange when you need flexibility!

There's even a two-for-the-price-of-one bonus when you haul coal with mine cars. You can haul timbers, men and supplies *into* the mine on the same cars that haul coal *out*. You don't need a duplicate transportation system...so you save the price of one!

If you're planning a new coal-haulage system, let your nearby A.C.F. Sales Representative show you what a *constant haulage* mine car system can do for you. American Car and Foundry Company, New York • Chicago • St. Louis Cleveland • Washington • Philadelphia • San Francisco • Pittsburgh Huntington, W. Va. • Berwick, Pa.

a.C.f. MINE CARS

for Constant Haulage



Oil won't rot it, rock won't tear it
B. F. Goodrich air hose lasts for years

THAT'S B. F. Goodrich Type 50 air hose at left, used exclusively on this big construction job at Bull Shoals Dam in Arkansas. Here's why—

Oil-resisting—Oil destroys ordinary rubber; particles of the tube come loose, choke up tube and drill. B. F. Goodrich Type 50 air hose has an oil-resisting tube that won't break into loose, gummy particles. On jobs where, with hose of ordinary rubber, the hose had to be replaced every few weeks to save tools, B. F. Goodrich air hose lasted for years. The cover of Type 50 is oil-resisting too. Workers with oily hands or gloves can handle it, use it near oily machines and surfaces.

Tear-resisting—On a quarry job like this, hose is always in danger of costly tears, breaks, snags. B. F. Goodrich engineers developed a special abrasion-resisting cover for air hose. Scraping over rock, rough floors, cinders, roads won't tear it. Won't check or crack from constant sunlight.

Recommended Services—B. F. Goodrich Type 50 air hose is recommended for shop tools, tie tamping, light and heavy portable compressors, air hoists, ore mining and quarry service.

B. F. Goodrich makes an air hose for every purpose, from small shop tool to big construction machinery . . . for small oil and air lines, heavy duty service in mines and quarries, for inside shops where oily conditions would rot ordinary hose, outdoor compressor service, air drills and pneumatic tools.

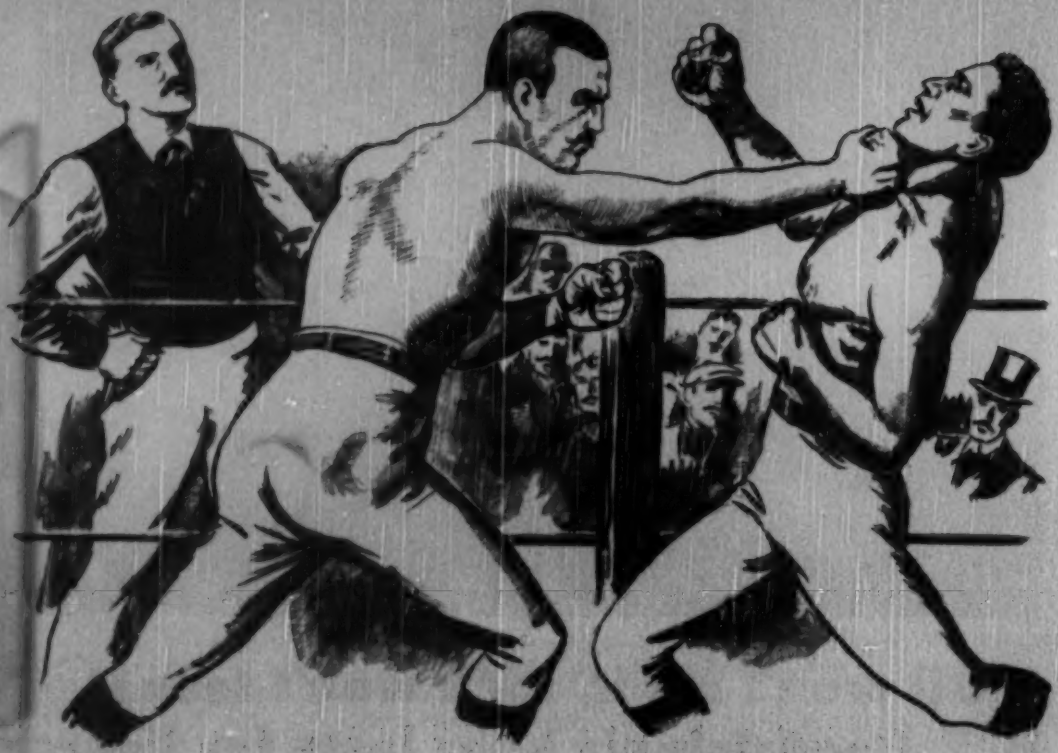
Your local BFG distributor has all the details and prices on these and other B. F. Goodrich air hose, many with features found only in hose made by B. F. Goodrich. Give him a call, or write *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Air Hose BY

B.F.Goodrich

The Champion

...IN BARE-KNUCKLE PUGILISM



John L. Sullivan, Boston, born in 1858, showed prodigious strength even as a youth. At 19, his first blow knocked his opponent off the stage of a Boston theatre. Soon he gained the reputation of being able to "Knock a horse down." At 24 he fought the then American Champion, Paddy Ryan, and knocked him out in the 9th round. For the next 10 years "The Boston Strong Boy" fought and beat all comers. He was 5' 10" tall, fighting weight 180 pounds. His method was simply to hammer his opponents into unconsciousness; his very appearance seemed to paralyze them. In 1883 he fought the English Champion, Charlie Mitchell, whose life was saved only by police intervention. Sullivan's trip to Europe was one long triumph until Mitchell, in 1888, held him to a draw in a 3-hour match.

Next year "John L." gained the decision over Jake Kilrain after 75 rounds. At the age of 34 Sullivan was defeated by young James J. Corbett in the 21st round of a fierce battle. He retired, and died in 1918 at the age of 60.

HULBURT OIL & GREASE COMPANY, PHILADELPHIA, PA.

Specialists in Coal Mine Lubrication

The Champion

...IN COAL MINE LUBRICATION

KNOCK OUT TROUBLE WITH

Hulburt Quality GREASE

HULBURT QUALITY GREASE showed its unusual ability to defeat Friction in Coal Mine Lubrication right from the start, too. Like "John L," this Quality Grease was made to do one thing and do it supremely well. The first day you use it to fight Friction, you begin a "Knockout" reign that never lets up. Unlike Sullivan, we don't just "hammer down" our opponent. HULBURT Lubrication Engineers go after Friction by going down into your mine, working with your own men, showing them how to solve friction problems, and do their lubricating properly—with the one right lubricant—HULBURT QUALITY GREASE.

FIFTY THOUSAND TONS OF FINE COAL

are now being dried every day by

BIRD COAL FILTERS

BIRDS like these have proved far and away the most efficient and economical means of dewatering fine coal.

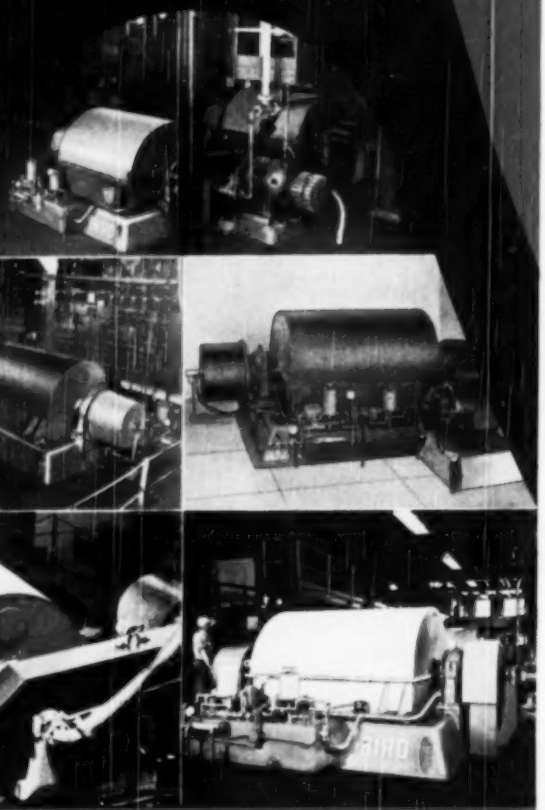
The BIRD delivers up to a ton a minute of 90 to 92% dry coal with the feed containing as little as 33% solids and as much as 10% minus 200 mesh fines.

The BIRD makes possible a closed water system.

The BIRD runs continuously for months without shut-downs for maintenance or overhaul.

Ask us to mail you the Bird Coal Filter Bulletin. It gives you the whole story.

BIRD
MACHINE COMPANY
South Walpole
Massachusetts



The BIRD

Continuous Centrifugal
COAL FILTER

THIS MONTH'S COVER

LOADING moves on schedule at one of the six pits of the G. & F. Coal Co., near Brazil, Ind., as a bulldozer teams up with the shovel to clean up the coal ahead.

LOOK FOR THESE

KEEP YOUR EYE ON COAL AGE this spring or you're likely to miss some really useful cost-cutting idea-packed articles slated to come your way. Here are just a few you'll want to watch for.

- **Planked roadways** for shuttle cars help lick a soft bottom to get high output at a newly mechanized Tennessee mine.
- **How an unusual conveyor** eliminates a downhill truck haul and generates power for the preparation plant at the same time.
- **Surface mining** without stripping in West Virginia, using a newly developed 5-ft. auger.
- **How to get** better roof bolting—methods and equipment.
- **What cave-ins** are doing to anthracite public relations and what can be done about them.
- **How to find out** what your workers feel about safety and get them behind your program.

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Keep rust and sludge out of hydraulic systems by using TEXACO REGAL OILS (R&O)

ASSURE SMOOTH, UNINTERRUPTED HYDRAULIC OPERATION

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TEXACO

TEXACO LUBRICANTS

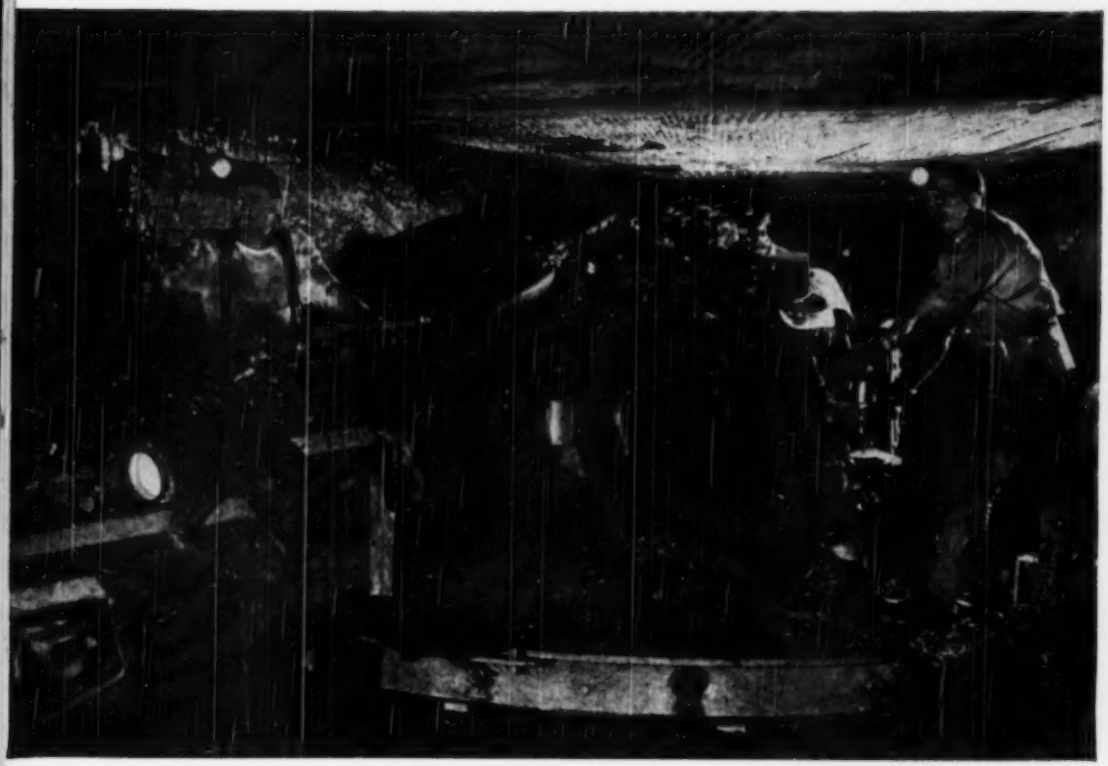


Photo courtesy The Jeffrey Mfg. Co.

CHARGE the hydraulic systems of your cutters, loaders, stripping shovels and other equipment with *Texaco Regal Oils (R & O)* and you'll avoid the rust and sludge that are the main causes of uneven operation and stoppages. *Texaco Regal Oils (R & O)* are highly refined turbine-grade oils specially inhibited against oxidation and rust, and specially processed to prevent foaming.

Because they keep hydraulic systems clean, *Texaco Regal Oils (R & O)* assure smooth, trouble-free operation and materially reduce maintenance costs. They prolong pump life . . . make fewer cleanings, drainings and overhauls necessary.

Another advantage: *Texaco Regal Oils (R & O)* require no "cutting back." You can get them in the proper viscosities for all machines and operating conditions, regardless of season or temperatures. Leading makers of hydraulic equipment in many fields recommend *Texaco Regal Oils (R & O)*, and many ship their units charged with them.

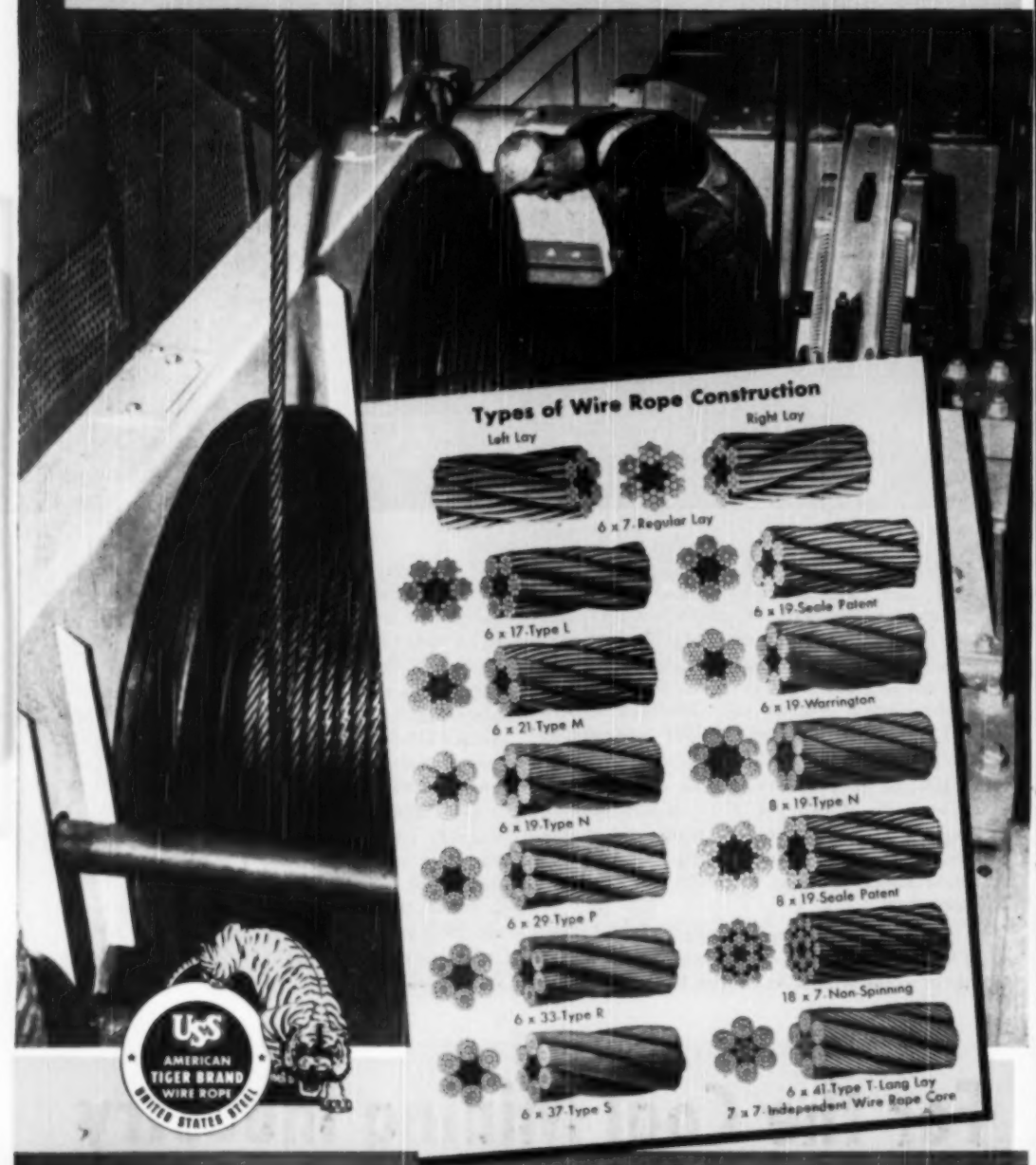
Get easier starts for mine cars. Lubricate wheel bearings of all types with long-lasting *Texaco Olympian Grease*. It assures easier starts and smoother operation, even at low temperatures . . . reduces bearing maintenance costs.

Let a Texaco Lubrication Engineer help you simplify your lubrication procedures, improve efficiency and reduce costs throughout your mine. Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

For the Coal Mining Industry

The Tiger Brand Specialist says-



"Here's what you should know about wire rope —and how to select, use and care for it."

THE three most important qualities that wire rope must possess are (1) strength, (2) fatigue resistance, and (3) abrasion resistance. Whether the rope is used on hoists, cranes, excavators, conveyors, loaders or unloaders, these properties are required in varying degrees depending on serivce requirements.

STRENGTH—This is determined by size, grade, and construction. Wire for wire rope can be made in any desired tensile strength ranging from iron grade at approximately 100,000 lbs. per sq. in. to improved plow steel grade at approximately 250,000 lbs. per sq. in. The knack of making Tiger Brand Ropes with uniform strength throughout shows the skill of the wire rope manufacturer.

FATIGUE RESISTANCE—The ability to make wire that will stand thousands of bends over drums and sheaves without breaking is no small accomplishment. The wire must be made with just the right amount of toughness and ductility. Tiger Brand Wire Rope is made from wire especially fabricated for wire rope use. Ropes composed of a large number of small wires will have higher fatigue resistance than those made with a smaller number of large wires.

ABRASION RESISTANCE—This is determined by the size and chemistry of the wires, especially the outer wires as they are exposed to the most wear. Obviously, the larger the wire size the greater the resistance to abrasion. Furthermore, the high strength steels are better able to withstand wear because of a greater carbon content. This means that improved plow steel ropes would have the highest abrasion resistance.

Getting the right balance

Individually, the properties of strength, fatigue resistance, and abrasion resistance are not difficult to obtain . . . but in wire rope making, it is impossible to accent one property without detriment to the other two. That's why the skill and experience of the men who make Tiger Brand Wire Rope are so important. Satisfactory performance demands that running ropes possess all three properties and therefore it is necessary to obtain an effective balance which meets the requirements of your particular job.

How to get longer wire rope life

Don't overload the rope.

Don't subject the rope to sudden impact loads.

Don't use undersize sheaves and drums—this is the commonest cause of fatigue breaks.

If vibration is present, make regular cuts from the end of the rope so as to change the dampened section.

Keep groove diameters proper size so as to avoid pinching of rope.

Avoid flange wear as a result of bad sheave alignment.

If grooves become fluted, it is usually a sign that the sheaves should be replaced with a harder material.

Lubricate regularly. Wire rope is a machine and requires adequate lubrication. It must also be protected from corrosion to retain strength.

Avoid kinking, improperly attached fittings, and uneven drum winding.

Make use of the Tiger Brand Wire Rope Specialist

It is very much to your advantage and to ours to maintain good operating practices. Call in the Tiger Brand Specialist at regular intervals and have him give you a FREE Check-up. He is thoroughly experienced in proper wire rope application.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
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Rockefeller Building, Dept. J-30
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Please send me a copy of your catalog, "American Tiger Brand Wire Rope."

Name.....

Company.....

Position.....

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City.....State.....

USS

AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

Allis-Chalmers HD-19

... with EXCLUSIVE HYDRAULIC TORQUE CONVERTER DRIVE

WORLD'S LARGEST TRACTOR

really cut grade"

SAYS BILL BROWN—TRACTOR OPERATOR FOR THE MAID MARIAN MINE OF THE CENTRAL INDIANA COAL COMPANY, ODON, INDIANA

"This is a swell outfit," said Bill. "You can see what you're doing . . . you can't kill the engine . . . and you don't need to shift so often — any operator likes that. I can hold my blade so I can really cut grade."

And can the Allis-Chalmers HD-19 Tractor and Baker 'dozer take it? Here's what Pierce Wright, head mechanic, says. "I've been with the company for 25 years and have worked a lot of tractor-bulldozers. In five months of continuous operation — 24 hours a day, seven days a week — we have had no trouble. I can't see a thing wrong with it."

Operators, mechanics, owners — all like the BIG HD-19 . . . because it was designed for ALL of them. It's built to outproduce and outlast . . . to get more done with less downtime, less operator effort, less maintenance and more simplified servicing.

Write for the new HD-19 catalog...or ask your Allis-Chalmers dealer for a demonstration. Start getting BIG YARDAGE, EASIER, AT LESS COST...NOW!

OUTPERFORMS ANY TRACTOR EVER BUILT

- **WEIGHT: 40,000 lbs.**
- **POWER: Smooth, compact General Motors 2-cycle Diesel engine — 163 hp. at flywheel.**
- **Hydraulic Torque Converter Drive automatically balances load and speed without gear-shifting. Performance is continuously smooth.**
- **Infinite Number of Speeds in Only Two Ranges — 0 to 3 m.p.h. in low gear and 0 to 7 in high; reverse to 5.5.**
- **Simplified Servicing and Maintenance — operating adjustments easily reached, quickly made — major assemblies conveniently serviced or removed as a unit.**
- **Reduced Lubrication — greasing intervals lengthened throughout . . . 1,000 hours on truck wheels, idlers and support rollers.**

ALLIS-CHALMERS Originator of the Torque Converter Tractor

TRACTOR DIVISION · MILWAUKEE 1, U. S. A.

BOOST PRODUCTION

EASY LOADING

Blade angle and design are two points that contribute to good or bad loading characteristics. The tough "Caterpillar" blade is set to shear hard-to-dig material, then direct and guide it into the loading chute. With 3 inches of special hard facing alloy deposited on these cutting edges, the user is assured of a blade that sharpens to a keen edge.

BIG TIRES . . . MORE TRIPS

When ground conditions deteriorate, air pressures are usually reduced to keep tire penetration at a minimum. The big and oversize tires used on "Caterpillar" Scrapers are able to have their pressures greatly reduced without overloading. That means they stay on top, roll more easily, allow hauling in higher gears and aid in piling up real yardage records.

'DOZER-TYPE EJECTION

'Dozer-type ejection rolls sticky clay out of the bowl with ease and precision. Typical of "Caterpillar" finely engineered design are the ejector plate guide rollers. These heat-treated rollers are mounted on adjustable eccentric shafts so that proper clearance may always be maintained between bowl sides and ejector plate. Binding or rubbing problems are eliminated.

CATERPILLAR

REG. U. S. PAT. OFF.

ENGINES • TRACTORS • MOTOR GRADERS

AND CUT COSTS

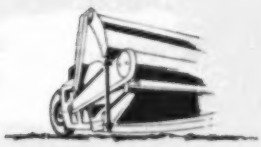
with "CATERPILLAR" SCRAPERS

WHEN the chips are down, you can count on a husky "Caterpillar" Scraper to come through for you. Stamina is built into every inch of its hide to stand terrific punishment. Its finely engineered design enables it to speed through jobs that slow down ordinary units. Pair it with its matching "Caterpillar" Diesel Tractor, and you've got a team that saves you money two ways—in higher production and lower maintenance costs.

Pictured here is a No. 70 "Caterpillar" Scraper with its matching D7. Hauling wet clay at the rate of 58 in-place yards an hour on a 2500-foot round-trip haul, this team is building a new stripping access road for the Midland Electric Company, Atkinson, Illinois. Neither dampness nor dust has any effect on the efficient operation of this rugged unit.

You can't talk quality into a machine. You've got to build it in—take a look at the "Caterpillar" Scraper's features and you'll see why this big yellow slugger really rates with men who know their business. Better still, call your nearby "Caterpillar" dealer today for information and a demonstration!

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

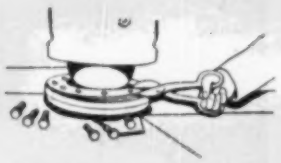


GOOD APRON DESIGN

"The sky is the limit" when raising the aprons on "Caterpillar" Scrapers. Open-top scraper design combined with long apron arms located outside the bowl assure the free ejection of heaping sticky loads. When ejecting fine materials such as sand, the maximum apron height can be reduced to provide a smooth spread with no gaps.

ENGINEERED CABLE SYSTEM

The entire "Caterpillar" cable control system is finely engineered to give constant easy performance. Accurately aligned heat-treated sheaves prevent cable chafing and minimize power drain on the tractor engine. All cables are shielded against abrasive materials, yet one man can easily thread the entire unit while keeping both feet on the ground.



LOW MAINTENANCE COST

Typical of "Caterpillar" in-built quality is the ball and socket joint connecting gooseneck to front axle. The ball is induction hardened with a tough center to withstand both wear and breakage. Spherical design enables the scraper to be maneuvered into extreme positions without binding. Shims are removed as wear occurs and a bronze liner rides between ball and socket to prevent steel-to-steel contact. Lubrication is through a single Zerk fitting.

DIESEL

EARTHMOVING EQUIPMENT

CATERPILLAR TRACTOR CO.
Box CA-J, Peoria, Illinois
Send me, without obligation, booklet,
"'Caterpillar' Scrapers Are Profit Makers."

Name _____

Address _____

3 PROVED WAYS TO CUT

WITH NON-EXPLOSIVE

CARDOX

1

Savings begin right at the mine face when the gentle, heaving action of expanding carbon dioxide replaces explosives. CARDOX mined coal is coarser and is rolled forward for quicker, easier loading. Complete absence of smoke and noxious fumes enables resumption of work without time loss immediately after shooting. Because there is less shattering, coal cleaning costs are lower; roof control costs are sharply reduced. Finally, CARDOX produces more premium size coal per ton due to reduction in costly degradation at the face, in shipping and storage.

AIRDOX

2

AIRDOX "shoots" coal with compressed air. Its "soft" action in breaking down the face produces a high percentage of coarse sizes free from shatter cracks . . . shears rib and top cleanly . . . rolls the coal forward in a loose pile for quick loading . . . reduces roof failure danger. Crews can enter immediately after the fall. Recommendations as to whether CARDOX or AIRDOX is the more efficient and economical for any particular mine will be made after examination by one of our engineers.

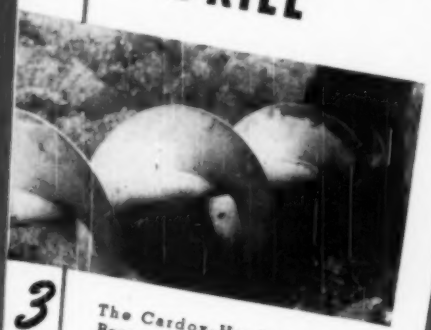
GET THE FULL SAVINGS STORY

Write today for complete information on CARDOX, AIRDOX and CARDOX-HARDSOCO equipment as applied to your operations.

MINING COSTS

MINING METHODS

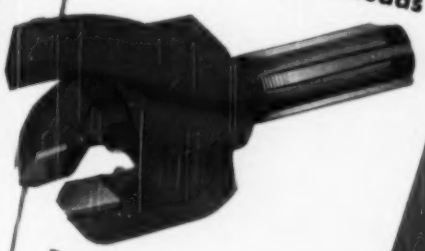
COAL RECOVERY DRILL



3

The Cardox-Hardsocg "Coal Recovery Drill" makes profitable the salvage of tonnage where overburden removal has become too costly for further stripping. The specially designed augers, available in diameters of 20" to 30", carry the coal in a continuous flow from the seam—can be used with portable conveyors for automatically loading trucks or cars.

CARDOX-HARDSOCG
Carbide Tipped Cutterheads



Tipped with carbide that approaches diamond-hardness, these Cardox-Hardsocg Cutterheads reduce drilling costs four ways. (1) They multiply footage between cutterhead changes; (2) their drilling capacity in hard material far exceeds that of molefoot drills; (3) they step up drilling rates under most conditions; (4) they have longer life in the heaviest service. Available in 2, 2¼, 2½, 2¾ and 3-inch sizes with two wings; in 5, 6, 6½ and 7-inch sizes with three wings; 8 and 9-inch sizes with four wings. May be had with recessed core breaker as shown or extended pilot and with spline, square or hexagon connection.

CARDOX CORPORATION

[illegible] BUILDING · CHICAGO 1, ILLINOIS

Huron-Portland 95% efficiency with

Tournadozer's giant rubber tires roll easily over surface . . . compact coal without crushing . . . reduce possibility of spontaneous combustion.

WORKS 9 MONTHS—16 hours a day, 7 days a week—ON COAL STOCKPILE

At the world's largest cement mill (annual production 6,000,000 barrels), Huron-Portland Cement Company, Alpena, Michigan, uses their high-speed, rubber-tired C Tournadozer 16 hours a day, 7 days a week, to handle coal between stockpile and mill storage bins. Job production studies covering 9 months of operation show Tournadozer easily moves mill requirements of 1,000 tons a day . . . in all kinds of weather . . . at 95% mechanical efficiency.

Cut coal-handling costs

Use of mobile "C" to doze coal 50′ to 300′ has eliminated tunnel handling . . . released one electric and one gas crane for other duties . . . eliminated use of two distributing belt conveyors and electric crane track . . . freed 3-man tunnel crew for other jobs in the giant mill.

Completely pleased with performance

"We are completely pleased with the exceptional reduction in costs and the superior improvement of organizational efficiency the Tournadozer gives us," is the way Superintendent W. G. MacDonald puts it. Management of the Huron-Portland Cement Company is also pleased with the reduced possibility of spontaneous combustion, due to the high compaction obtained by Tournadozer's giant rubber tires rolling over the coal surface.

LeT

See your Le Tourneau Distributor NOW for complete information

Plant shows TOURNADOZER

Tournadozer eliminates necessity for 3-man tunnel crew and elaborate crane-conveyor system formerly used to supply coal for mill.

Shows all-around utility

In addition to handling 1,000 tons of coal a day, Tournadozer's ability to travel and work at high speeds pays off in *extra* assignments around the Huron-Portland mill. The versatile rubber-tired Dozer is used to clear snow, to do miscellaneous excavating, and, frequently, to push-load the company's Tournapull earthmover, which handles coal at the docks. Tournadozer also switches box cars and cleans up around tracks where its low-pressure tires cross over or work along tracks without damage to rails, ties, or the giant rubber tires of the Dozer.

Get facts and figures today

Perhaps your present jobs do not involve coal stockpiling . . . but keep in mind this and many other industrial, mine, and quarry operations. Your fast-stepping, drive-it-anywhere Tournadozer can extend its big daily earnings to a year-round basis. Ask your LeTourneau Distributor for facts and figures.

Tournadozer, Tournapull-Trademark Reg. U. S. Pat. Off. C140

Dozing in second and third gears, Tournadozer easily moves 1,000 tons of coal every day over distances of 50' to 300' from stockpile to storage bins . . . with time to spare for odd-job assignments.

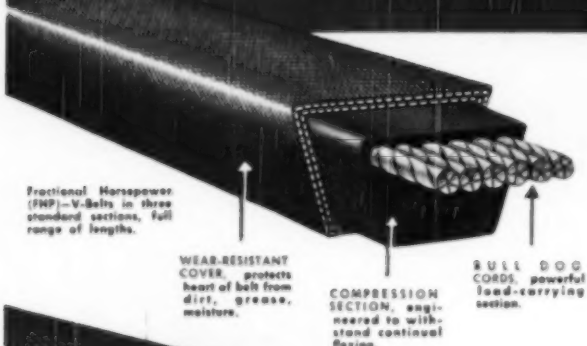
LETOURNEAU PEORIA, ILLINOIS — JOB-PROVED Over 645 Built and Shipped — TOURNADOZERS

IT'S RUBBER THAT PUTS THE ACTION IN TRACTION

BWH

DEPENDABLE RUGGEDNESS

BULL DOG V-BELTS demonstrate how to get the most out of V-Belts


Fractional Horsepower (FHP)—V-Belts in three standard sections, full range of lengths.
WEAR-RESISTANT COVER, protects heart of belt from dirt, grease, moisture.
COMPRESSION SECTION, engineered to withstand continual flexing.
BULL DOG CORDS, powerful load-carrying section.

Industrial V-Belts in A, B, C, D and E sections — full range of lengths from 26"-660".

OUTSTANDING ADVANTAGES OF BULL DOG V-BELTS

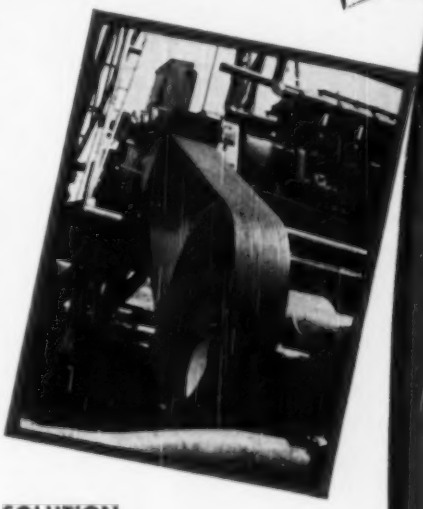
1. Fewer Maintenance Headaches. Because BULL DOG V-BELTS require less adjusting and last longer, they save time, money and worry in maintenance.

2. Longer Belt Life. Because new, quality-controlled compounds developed in BWH laboratories run cool, don't crack or deteriorate under severe flexing.

3. Backed by BWH Reputation for Extra Service. In the 72 years that BWH has been a leader in the mechanical rubber manufacturing field, BWH products have built steady fame for outstanding performance. BULL-DOG V-BELTS fully live up to BWH reputation for dependable ruggedness.

Efficient V-Belt operation insures steady, smooth, low-cost power transmission, without maintenance worries, over long periods of time. And that's exactly the kind of economical, worry-free service BULL DOG V-BELTS deliver in all types of industry.

Each job has its own problems, however. Here are some of the common ones that engineers report in V-Belt operation, with BWH solutions:



PROBLEM	SOLUTION
Excessive Cover Wear on V-Belts	Check sheaves for worn grooves. Check alignment between sheaves. Check to see that sheaves are tight on shafts.
Covers Loosen . . Rubber Gets Soft and Sticky	Check for excessive oily conditions. If contact with oil or grease cannot be prevented, then specify BULL DOG HSO V-BELTS, which are oil resistant. (Also heat resistant and static conducting.)
V-Belts Failing Within Few Hours of Installation	This is usually caused by prying V-Belts over edge of sheaves, causing internal cords to break. Correct method of installation is to move motor of driven machine until belts do not have to be forced onto sheaves. Then move motor back until sufficient tension is applied.
New V-Belt Installed As Replacement Fails, While Old Belts Continue Running	Never install a new belt in a set of old belts, because it will be either shorter or longer than the old belts. If shorter, it will be excessively overloaded and fail. If longer, it will not transmit an equal share of the load. Always install a complete new set of belts and retain old belts for an emergency, or for temporary replacement if needed.

It will pay you to investigate BULL DOG V-BELTS on your next installation. They have what it takes for smoother operation on both FHP motors and on high-powered industrial jobs.

HAVE YOU A JOB WHERE STAMINA COUNTS?

Bring us your toughest problems. We're specialists in solving them. Consult your nearest BWH distributor or write us direct.

FOR ALL MECHANICAL RUBBER GOODS CONSULT BWH

Established in 1878, BWH is today one of the world's largest manufacturers of mechanical rubber goods. Among the quality-famous BWH products which are today helping industry to do better jobs at lower cost are the following:

CONVEYOR BELTING	OIL INDUSTRY HOSE
ELEVATOR BELTING	STEAM HOSE
TRANSMISSION BELTING	WATER HOSE
AIR HOSE	OIL FIELD SUPPLIES
CONTRACTORS' HOSE	FRICTION TAPE
FIRE HOSE	SPLICING COMPOUND

BWH
DEPENDABLE RUGGEDNESS

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS., U.S.A. • P.O. BOX 1071, BOSTON 3, MASS., U.S.A.

A TRULY PROFESSIONAL *Engineering Approach* TO YOUR PROBLEMS . . .

TO ACHIEVE THESE *RESULTS* . . . . . .

. . . reduced cost of operating . . . a more salable product . . . more productive manpower . . . more for the worker . . . a satisfactory return on investment.

A&G engineers work for the client alone — above and below ground. Mines have been planned, preparation plants designed, and built for nearly every seam of coal being mined in the United States today.

Experienced as they are, these engineers design to eliminate excess equipment — to simplify operations — to lower maintenance costs, and being independent, they avoid red tape and many of the cumbersome procedures that develop into high costs each year.

A&G engineering is of particular importance now when costs are mounting in many directions and a sizable cut in expenses is most necessary. A cost reduction through modernization program is your answer to this need and can be effectively accomplished. A&G "on the field contacts" together with our practical experience in solving problems for mining operations throughout the world, pays off in many ways for operators.

Our services to both large and small operations are rendered on a time and material basis — you are given a definite breakdown of every item that goes into your mine.

•

Scope OF SERVICES . .

- Design and construction of new plants and their various units.
- Organization, operation, and management of mines.
- Below ground modernization and mechanization.
- Reconstruction, revamping, or improvement of existing plants.
- General consulting work regarding power, equipment, operation, and various mining problems.
- Valuations for financing, fire loss, taxation purpose — reports and appraisals.

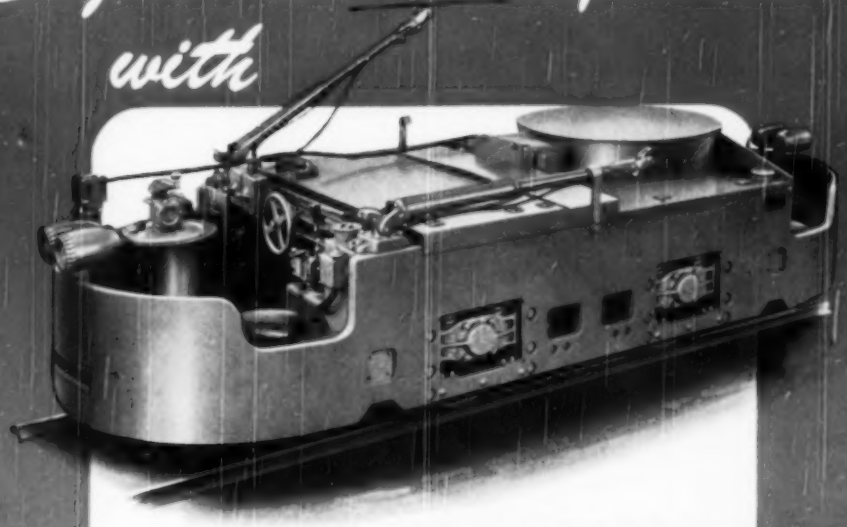
We work with undivided responsibility to you at a fixed fee. We are not hampered by any connections which might prejudice the true professional engineering approach to your problems.

ALLEN & GARCIA COMPANY

CONSULTING AND CONSTRUCTING ENGINEERS

332 S. MICHIGAN AVE., CHICAGO 4, ILL. • 120 WALL ST., NEW YORK 5, N. Y.

Engineered Transportation with



JEFFREY LOCOMOTIVES

Gathering and Haulage Types

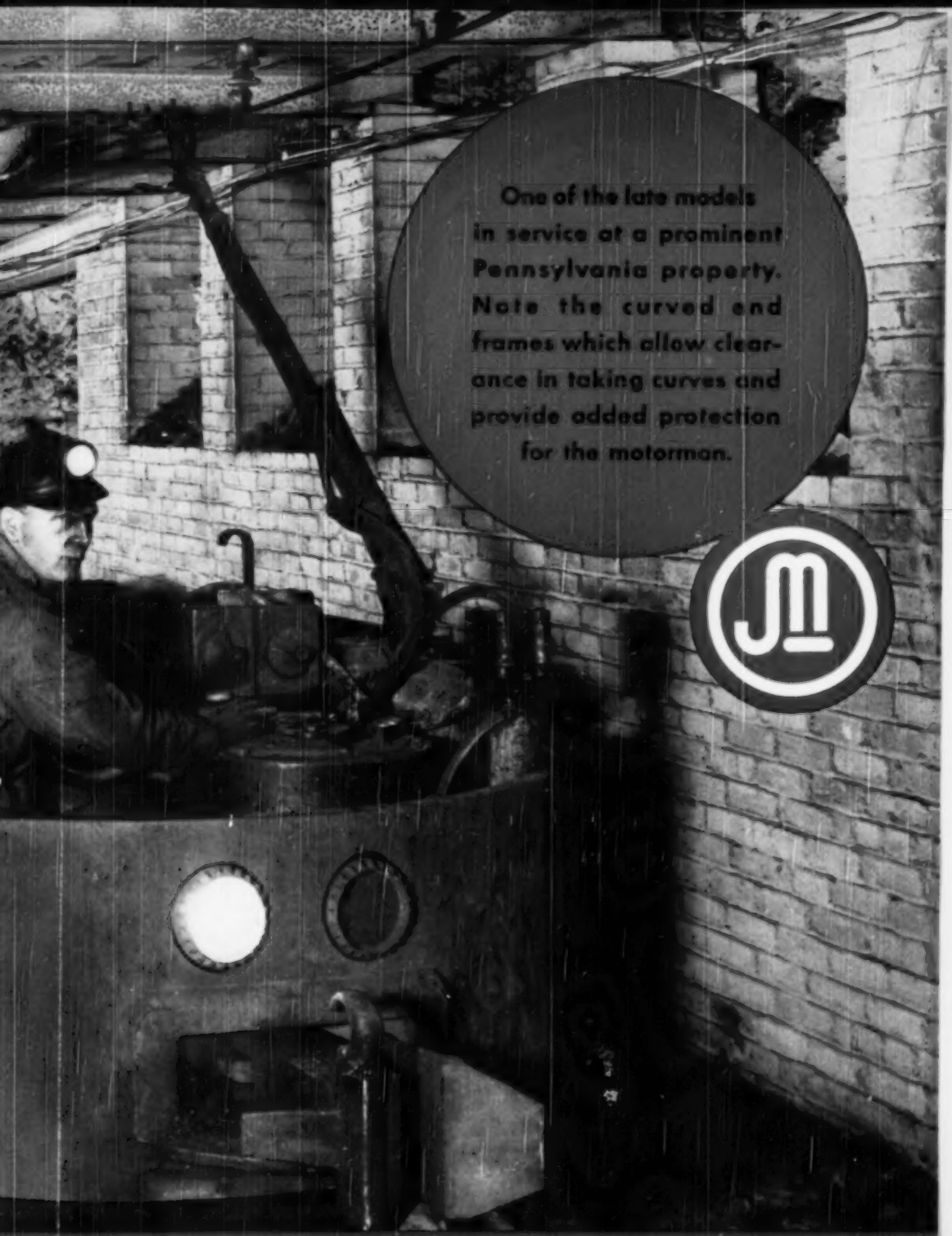
The widely diversified conditions prevailing throughout coal properties requires transportation equipment that is designed to meet the specific needs of that property.

For more than 65 years Jeffrey has been designing, developing and building locomotives for coal mine service. With this wealth of experience and a corps of specially trained engineers Jeffrey is in a position to help you with your transportation system.

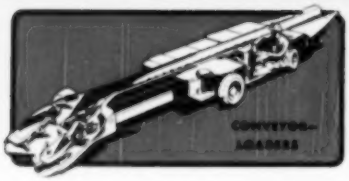
There are three types—trolley, cable reel and storage battery—to cover all phases of service either gathering or main haulage . . . and under all operating conditions.

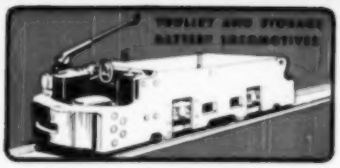
One of the new streamlined locomotives is shown above. It is an 8-ton explosion tested job.

WHEREVER COAL IS MINED YO


One of the late models in service at a prominent Pennsylvania property. Note the curved end frames which allow clearance in taking curves and provide added protection for the motorman.
JM

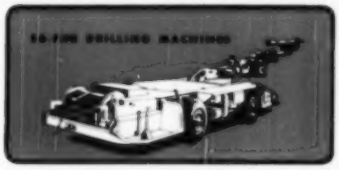
OU'LL FIND *JEFFREY* EQUIPMENT

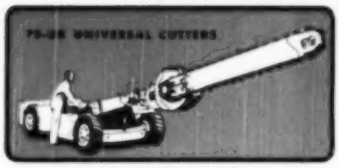


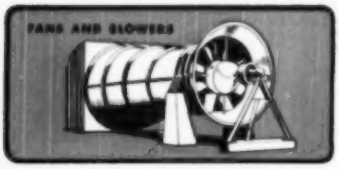


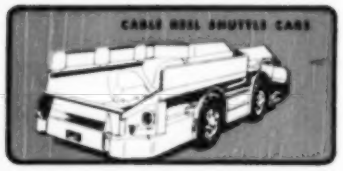
JEFFREY

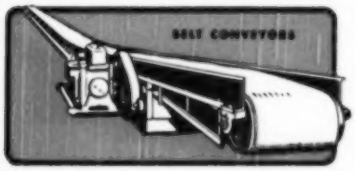
EQUIPMENT FOR COAL MINES











THE JEFFREY MANUFACTURING COMPANY

Established 1877

General and Export Sales Offices

COLUMBUS 16, OHIO, U. S. A.

DISTRICT SALES OFFICES

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Bell Building
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Carew Tower
CLEVELAND 13,
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Ernest & Cranmer Bldg.
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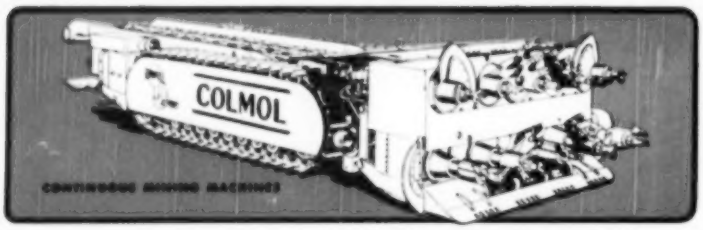
Guaranty Bank Bldg.
JACKSONVILLE 2,
Barnett Bank Building
MILWAUKEE 2,
735 N. Water Street
NEW YORK 7,
30 Church Street
PHILADELPHIA 3,
Broad St. Station Bldg.
PITTSBURGH 22,
Oliver Building
SALT LAKE CITY 1,
101 W. 2nd South St.
ST. LOUIS 1,
Railway Exchange Bldg.
SCRANTON 3,
122 Adams Avenue

SERVICE STATIONS

BIRMINGHAM • PITTSBURGH • JOHNSTOWN • SCRANTON • MT. VERNON, ILL. • HARLAN, KY.
In West Virginia: BECKLEY — CABIN CREEK — LOGAN — MORGANTOWN — WELCH

FOREIGN PLANTS

JEFFREY MANUFACTURING CO. LTD., Montreal, Quebec
BRITISH JEFFREY-DIAMOND LTD., Wakefield, England
JEFFREY-GALION (PTY.) LTD., Johannesburg



USERS SAY G.E.'S 9574 ALL-PURPOSE* INSULATING VARNISH "is tops!"

J. L. Hughes

How do users like General Electric's new all-purpose insulating varnish G-E 9574?

Here's a statement from J. L. Hughes, owner of the J. L. Hughes Electric Company, Columbus, Ohio.

"We have found from test and practical experience that General Electric general-purpose varnish 9574 is tops for our work."

Mr. Hughes knows what he is talking about. He has been in the business of motor repair and rewinding in Columbus for thirty-three years.

YES, G-E 9574 OFFERS YOU

One varnish you can depend on for ALL* jobs.

A Combination of electrical, chemical and mechanical properties formerly found only in special-purpose varnishes.

Easier Handling: Low baking temperature; deep penetration; simple thinning with petroleum spirits.

*G-E 9574 gives excellent results on all types of coils except extra-high-speed armatures. It is one of G. E.'s complete line of electrical insulating materials, including adhesives, wedges, cements, compounds, cords and twines, sleeving, wire enamels, mica, papers and fibers, permafils, tapes, tubing, varnished cloths, and varnishes.

SEND FOR BULLETIN! If you haven't yet tried G-E 9574, get in touch with your local G-E Distributor, or write for our new bulletin to Section K1, Chemical Department, General Electric Company, Pittsfield, Massachusetts.

You can put your confidence in

GENERAL ELECTRIC

C10-10-K1

Section K1, Chemical Department
General Electric Company
Pittsfield, Mass.

Please send me your free bulletin "G-E General-Purpose Insulating Varnish 9574."

Name _____

Business _____

Address _____

City _____ Zone _____ State _____

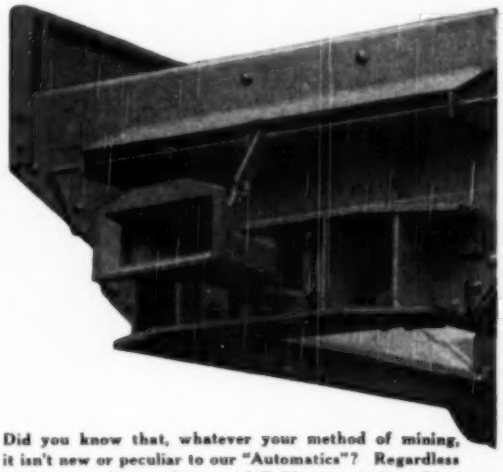
No Clean-up HERE...

THE SANFORD-DAY *Completely Sealed* "AUTOMATIC"

The "COMPLETELY SEALED" feature now being built into every S-D "Automatic" drop bottom car is money saving news to mine operators who have been looking forward to the day of dust-free tracks. Coal dust accumulation is expensive. Some mines have been spending over $10,000 annually on track clean-up alone. What is it costing you? The S-D "Sealed Automatic" completely eliminates this expense because it is dust sealed both at wheel hoods and at the necessary clearance space between the doors and the frame. The coal dust can't dribble out and accumulate on the track . . . it stays in the car until it is dumped in the bin with the coal. This patented Sanford-Day feature is another step in maintaining Sanford-Day leadership in saving money for mine operators. You still get the same big capacity and automatic unloading. You get our improved long-life construction and our foolproof "Jerk-Out" unlatching device, that operates beneath the car. Now, with this revolutionary "COMPLETELY SEALED" construction . . . you get the greatest money saving car the industry has ever known.

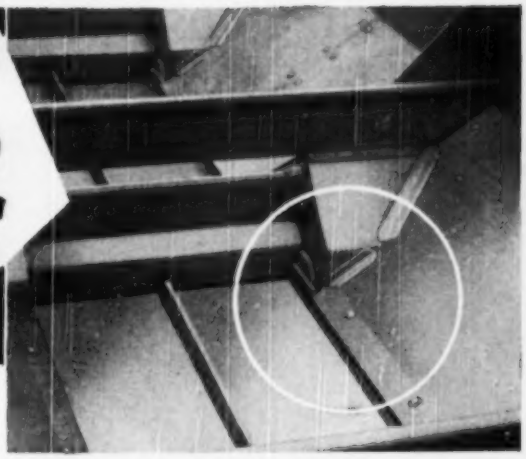
The S-D "Automatic", shown above and below, has our foolproof "Jerk-Out" unlatching device that operates underneath the car. It has two latch hooks for safe and foolproof operation, and all unlatching mechanism on end of car is eliminated.

No other car can offer you the advantages of S-D "Automatics" for efficient service, maximum production and low cost per ton of coal handled.



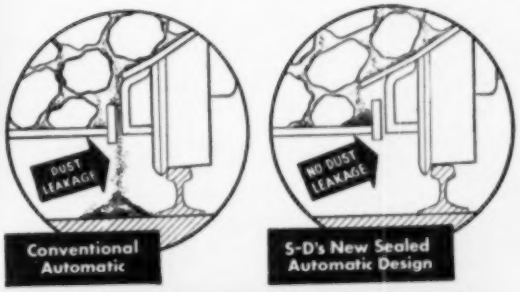
Did you know that, whatever your method of mining, it isn't new or peculiar to our "Automatics"? Regardless of the type of mine, there are S-D "Automatics" working under the same conditions elsewhere, and our company can show you these installations. So, if you have a special problem . . . if you're looking for greater efficiency, write today, we'll be glad to furnish complete details on the S-D "Completely Sealed Automatic," and how they are used in mines similar to yours. Seeing is believing, just contact us.

..When You're "Sealed" HERE



Every S-D "Sealed Automatic" Has The Exclusive DUST-ROOF SEAL . . .

The "Dust-Roof" seal consists mainly of a car sill construction that permits extension of the sides into the car to form a "Dust-Roof" over the necessary clearance space between the drop bottom door and the car frame. This "Dust-Roof" extension carries the dust across the clearance space and deposits it in drop bottom door. (As illustrated in the photo above and the cross-section drawing below at right). Without this "Dust-Roof," the dust follows the side down until it reaches the clearance space where it dribbles through and accumulates on the tracks (as illustrated in the cross-section drawing below at left) To make this sealed-car 100% effective, even the wheel hoods are dust sealed. With the S-D "Completely Sealed Automatic," the dust is sealed-in until the doors are tripped at the bin. The expense of track clean-up is eliminated.



Conventional Automatic

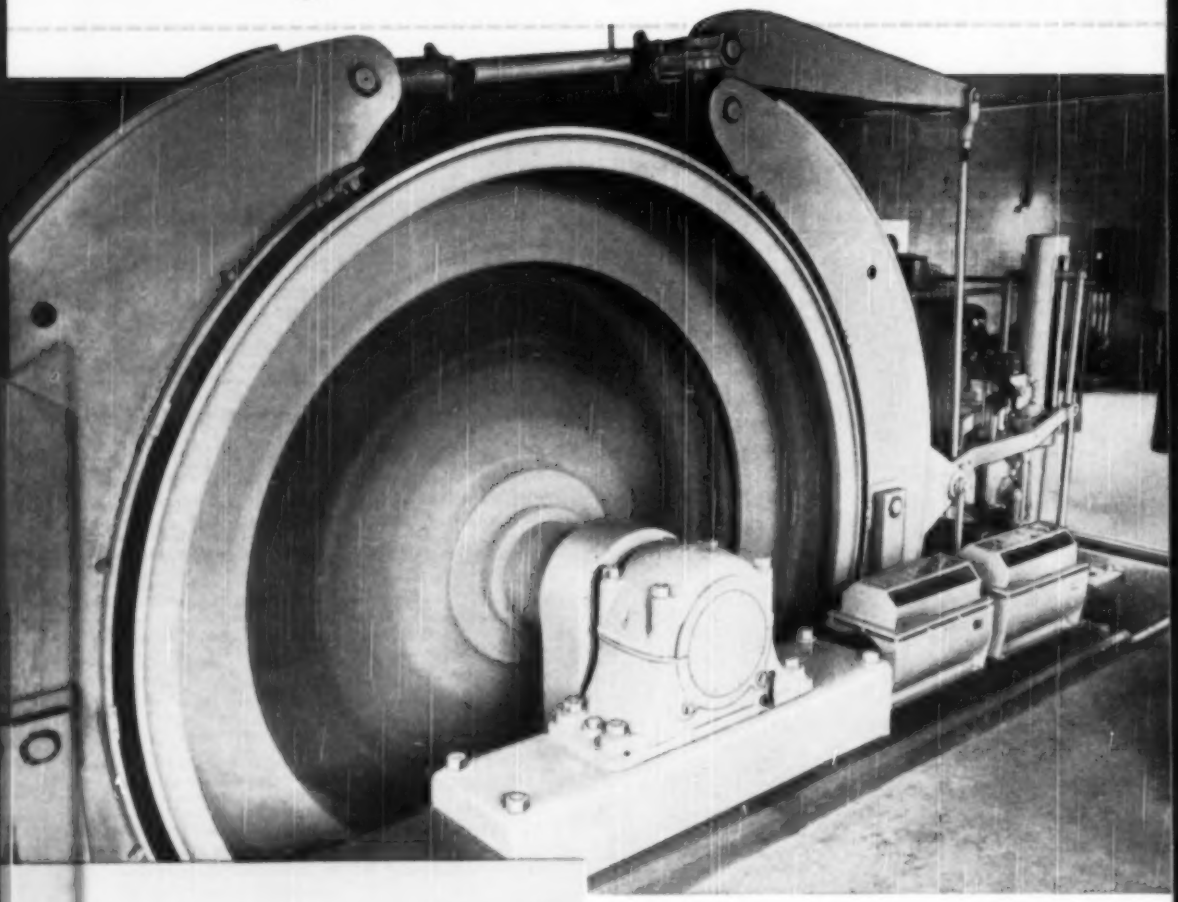
S-D's New Sealed Automatic Design

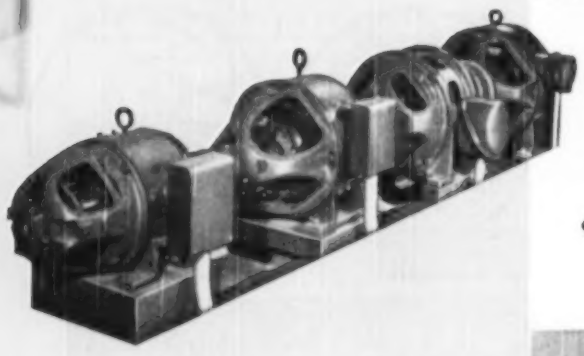
Sanford-Day Iron Works

KNOXVILLE TENNESSEE

YOU CAN BE **SURE**.. IF IT'S

Westinghouse





"Operatorless operation" is provided by this new Westinghouse-equipped Automatic Hoist installed in the Green Valley and Wabash Mine of the Snow Hill Coal Corporation. After the hoist is placed in operation at the start of a shift, the automatic control provides continuous hoisting. It moves coal from the hopper onto the weighing pan, fills the skip, travels it upward, dumps it and returns it for another load. The cycle is repeated indefinitely until stopped, or until there is no coal left in the hopper.

These Rototrol rotating regulators provide the "judgment" for automatic control. They assure uniform time cycles of preset duration, smooth stopping and accurate positioning of the skip at the loading pocket and on the dumping horns.

WESTINGHOUSE

Westinghouse

EQUIPMENT FOR THE MINING INDUSTRY

NOW... AUTOMATIC HOIST OPERATION

FOR MORE TONS PER MAN-HOUR

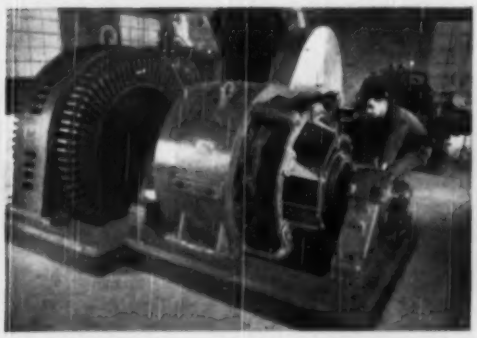
The installation shown at the left is the Westinghouse-equipped Automatic Hoist in the new mine of the Snow Hill Coal Corporation in Indiana. The operation is continuous and completely automatic.

Using the Rototrol rotating regulator as a robot control, the hoist moves up to 700 tons an hour at any preselected working level. The operator simply sets the hoist at the beginning of the shift.

This Automatic Hoist is the latest addition to the complete line of Westinghouse drives for coal, metal and nonmetallic mine hoists. It is one more example of how Westinghouse co-ordinated engineering meets the need of the mining industry *for more tons per man-hour.*

If you have an underground hoisting problem, Westinghouse Mining Industry Specialists will gladly help you select and apply the right electric drives. Call your nearest Westinghouse representative, or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

J-94808

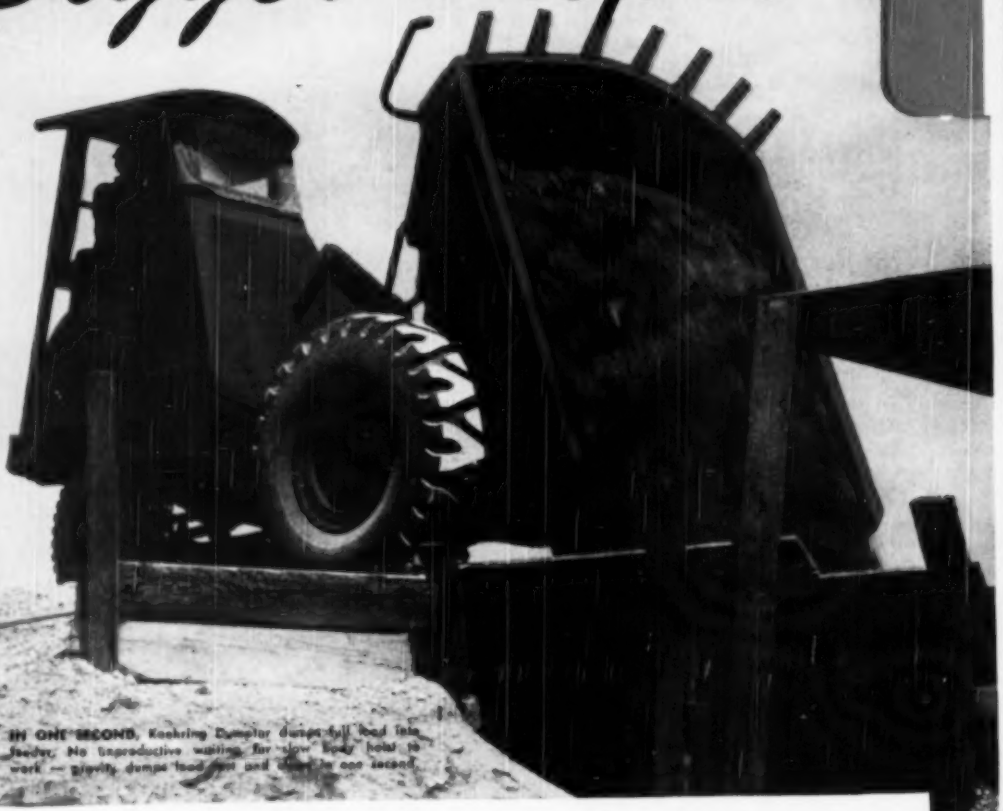


This 1000-kw, 720-rpm synchronous motor-generator set supplies power for the automatic hoist. In the background may be seen the 1250-hp, 450-rpm, d-c motor and the cylindro-conical cable drum with maximum rope speed of 2485 fpm.

The control center unit provides two types of control. (Left) The relay board, containing relays, circuit breakers and contactors, gives automatic operation. (Right) When desired, the operator can operate hoist manually for inspection.

FOR

Bigger Output



IN ONE SECOND, Koehring Dumpster dumps full load into feeder. No unproductive waiting for slow body hoist to work — gravity dumps load fast and clean in one second.

STEEP GRADES — Ability to pull full loads up grades to 24% make Dumpters especially suitable for heavy hauling out of pits. Sturdy hydraulic brakes give complete control on steep down-hill runs. Parking brake is independent.

ROUGH HAUL ROADS don't slow up Dumpters. Ruts won't twist heavy-duty frame because steering axle oscillates as much as 21°, takes the strains out of rough mine road travel. Big tires help cushion shocks, give better traction, flotation.

KOEHRING HEAVY DUTY

in mines, pits and quarries
KOEHRING DUMPTORS
load FASTER • haul FASTER • dump FASTER

ON typical, rough, off-road hauls, you can increase trips per hour, yardage per day and reduce maintenance problems with Koehring heavy-duty, 6-yard Dumptors. Here's why:

Short Turning Radius, Big Target SAVE SPOT AND LOAD TIME

Short, 19'6" turning radius and compact design let Dumptor get close in under shovel . . . save jockeying back and forth. Big, 64 square-foot body opening provides an easy-to-hit target. Result — increased shovel production, more haul-time, less spot and load time.

Heavy-Duty 6-Yard Body BUILT FOR HEAVY ROCK SERVICE

To take severest shocks of shovel-loading, all-welded Dumptor bodies are heavily ribbed with 4" channels. Bottom of seasoned 1-⅝" oak timbers, between two 5/16" steel plates, cushions load shocks. In heavy mine and quarry service, Dumptors give you less down-time, more work-time, year in, year out with less maintenance care.

Ton of Strength per Ton of Payload SPEEDS TRAVEL ON ROUGH HAULS

Koehring Dumptors have rugged 8" ship channel main frame, heavily trussed . . . 4" chrome steel drive axles . . . cast alloy-steel "I" beam steering axle, that take the twists and strains of fast off-road travel. Big rugged tires take road shocks. There are no leaf springs . . . Dumptor needs only one big double-coil spring, on steering axle. You have NO spring maintenance.

6 HP for Every Ton of Gross Weight GIVES GREATER GRADE-ABILITY

Dumptor has 6 HP for every ton of gross vehicle weight. That means more "GO," more acceleration, less shifting on grades. Also, plenty of power to climb grades to 24% with full load. Dumptors are built to stand up under the toughest hauling of mine and quarry service.

No Slow, Troublesome Body Hoists . . . DUMPTOR DUMPS IN ONE SECOND

At the dump, gravity dumps load . . . *fast*. One second and body is empty . . . you're on the way for another load. You save 15 to 25 seconds every dump. No mechanical complications . . . no body hoist maintenance. Free-swinging kick-out pan breaks suction of sticky materials . . . adds 3/16" of steel to strength of Dumptor bottom.

No-Turn Shuttle Operation SAVES SLOW TURNS EVERY TRIP

Because Koehring constant-mesh transmission makes same 3 speeds available in both directions, Dumptors are never turned on shuttle hauls. On a 1,000' haul (16 round trips per hour), this gains 8 minutes every hour.

Let your Koehring distributor show you what Dumptors can do to save money in your mine, pit or quarry.

Koehring 605 Rock Shovel Keeps Pace with Fast Dumptor Hauling Speed . . .

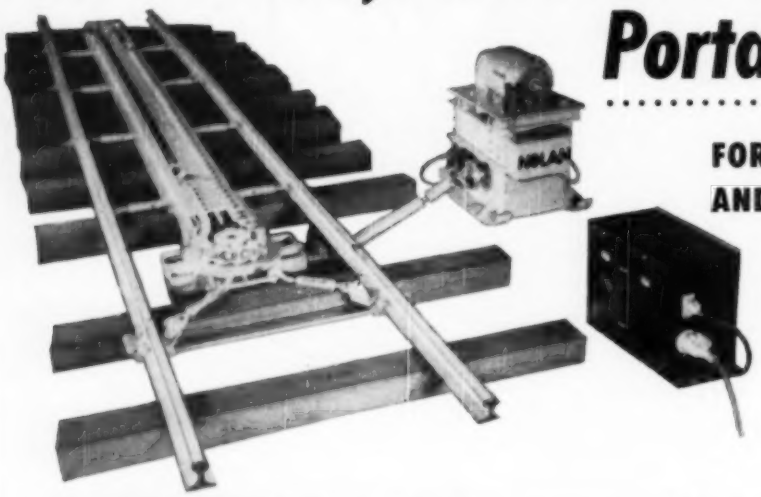
For balanced, high-production teamwork on both your excavating and hauling operations, team up your Dumptors with the Koehring heavy-duty 605 Rock Shovel. Its fast operating speeds . . . big 1½-yard dipper capacity . . . rugged, extra strong boom, with shock-absorber mount . . . and big, power-operated clutches, all keep production high, costs low. Your Koehring distributor also can show you heavy-duty Koehring excavators in ½-yard, ¾-yard, 2½-yard sizes to satisfy your exact requirements.

ASK, TOO, FOR CATALOG ON 2½-YARD 1005

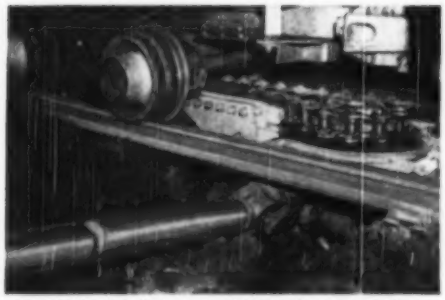
KOEHRING COMPANY, Milwaukee 10, Wisconsin

Subsidiaries: JOHNSON • KWIK-MIX • PARSONS

Announcing the new NOLAN *Porta-Feeder*

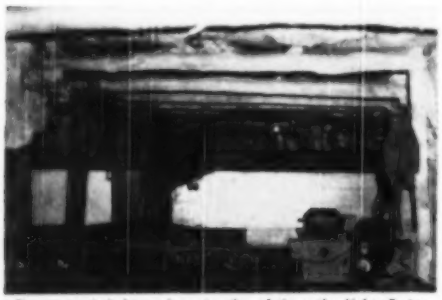


FOR QUICKLY AND ECONOMICALLY SPOTTING CARS FOR LOADING . . .



Porta-Feeder Installation in a PITTSBURGH COAL CO. Mine

Close-up view of the heavy propeller shaft and universal joint assembly used to drive the new Nolan Porta-Feeder. Note the strong, massive construction of the feeding mechanism, and its position on top of the track ties.



The compact design and construction of the entire Nolan Porta-Feeder installation in the Pittsburgh Coal Company mine is shown in this photograph.

Investigate the Nolan Porta-Feeder for ease of installation, economy of operation, ruggedness and safety in your mine car-spotting equipment!

The Porta-Feeder mounts between the rails on top of the track ties, secured by jacks that permit quick movability. Little or no excavation or preliminary foundation work is necessary. The drive is on skids and is connected to the gear head by a strong universal joint and propeller shaft assembly. A sealed drive head allows operation in water up to the base of the rails. Reciprocating pushing dogs deliver constant forward feeding motion.

Because of its comparatively light weight, and freedom from need of expensive, permanent-type anchorage, the Nolan Porta-Feeder can be quickly moved as necessary, without excessive loss of time or production. No ropes or cables are used in the Porta-Feeder. High efficiency is attained through the short-shaft delivery of power and uninterrupted forward flow of action. Extreme ruggedness of construction assures long service life.

Actual mine service has proved the high efficiency of the Nolan Porta-Feeder—write for full details.

NOLAN

THE NOLAN COMPANY *BOWERSTON, OHIO*

Penn Valley Mining Co., Hunkers, Penna.

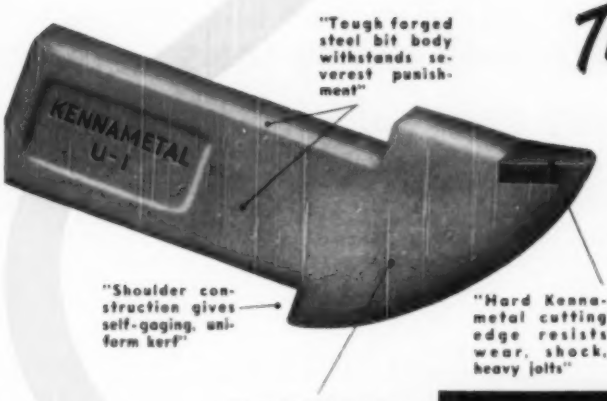
Gets Better Bit Performance

These Savings

$200 per month on reconditioning cost

20 per cent on man-hours at the face

A total of 6 cents per ton on overall cost


KENNAMETAL U-1
"Tough forged steel bit body withstands severest punishment"
"Shoulder construction gives self-gaging, uniform kerf"
"Hard Kennametal cutting edge resists wear, shock, heavy jolts"
"Head construction gives maximum cutting edge support — longer bit life"

Kennametal Bits

"Give Best Cutting Service"
Says John Fordyce, Superintendent

John W. Fordyce follows the policy "better methods and materials make for higher and less costly production." One of the things he did to carry out the policy at Penn Valley Mining Co. was to equip all mining machines with Kennametal. He says, "We cut three more places per machine shift, and save about 20% on man-hours at the face."

A reduction from 10,000 bits to 50 bits per 5,000 tons of production has meant lower bit cost per ton. Bit grinding as a full time duty has been eliminated. All totaled, an estimated 6 cents per ton has been saved.

Sound construction backed by years of manufacturing—and the big "plus value" of the hard Kennametal cemented carbide cutting edge makes Kennametal your BEST choice. Only Kennametal gives you (1) Years of intensive research in matching together the properties of steel and carbide, (2) More years of quality product development and manufacturing.

There's a standard Kennametal bit specially-designed to meet your particular need. Contact the Kennametal representative near you, or write—Mining Div., Kennametal, Inc., Latrobe, Pa.

- **Ordinary Cutting Conditions Style U-1**
- **Difficult Cutting Conditions Style U-1H**
- **Severest Cutting Conditions Style U-8**

MAIL THIS COUPON TODAY

KENNAMETAL INC., Latrobe, Pa.

Please send free booklets checked below:

- ☐ Kennametal Machine Bit Grinding Jig
- ☐ Kennametal Bits for Bolt Hole Drilling
- ☐ Kennametal Bit for Hitch Hole Drilling
- ☐ Kennametal Machine Bits and Drill Bits
- ☐ Have representative call

NAME .....

POSITION .....

COMPANY .....

ADDRESS .....

KENNAMETAL

TRADE MARK. REG. U.S. PAT. OFF.

Drill Bits • Machine Bits • Strip Bits • Rock Bits

CARBOLOY

THE GREATEST NAME IN THE CARBIDE TOOL INDUSTRY

Builds quality into these coal-mining tools . . . for greater mining economy and lower cost per ton

Quality counts . . . and that's why you should count on Carboloy for your coal-mining tools!

These tools, tipped with Carboloy Cemented Carbide—*the hardest metal made by man*—are backed by more quality features and services than most other carbide tools on the market. Here are the features that have been proven by actual field tests to spell lower cost per ton of coal for you:

1 **Continuous grade improvement**—to meet metallurgical development problems, rather than changing grades.

2 **Engineering and research**—the nation's largest and most complete facilities devoted to carbides.

3 **Test-guaranteed quality**—backed by 29 rigid quality tests to meet the most exacting requirements of industry.

4 **Unequalled service**—Carboloy's extensive technical experience available to help you with your coal-mining problems.

5 **Production facilities**—the finest for mass production of cemented carbide tools.

6 **Performance record**—proved by amazing case history records reported by users in industry.

7 **Fast delivery**—through strategically located distributors, for immediate service.

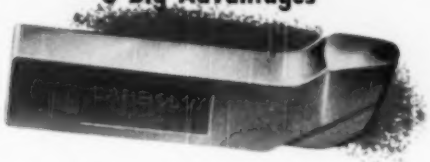
For greater performance, for greater quality, for greater coal-mining economy—it's Carboloy right down the line! Read about the tools on the opposite page. They're Carboloy's winning bid for better coal-mining bits!

Carboloy Company, Inc., 11120 E. 8 Mile Road, Detroit 32, Michigan

THESE CARBOLOY BITS BRING YOU LOWER DRILLING COST PER TON!

Carboloy's extensive research has brought about these *improved* products with new design features that mean greater operating economy for you!

Carboloy's Improved Mining Machine Bit —8 Big Advantages



Increased efficiency and cutting speed, *as well as reduced operating costs!* That's the story behind this improved Carboloy coal-cutter bit. Here's the line-up of advantages you get:

- **Shank level with Carboloy insert, for free flow of coal.**
- **Less shank steel to grind, yet adequate insert support.**
- **Less carbide to grind; faster grinding, greater tip economy.**
- **Smaller point affords less power consumption.**
- **Forged alloy steel shank resists bending, permits set screw clamping.**
- **No shoulders; may be set to any gauge size within range of uses.**
- **Maximum "hold" through combination of braze and mechanical holding.**
- **Approximately 50% greater thickness of insert at cutting edge.**

Carboloy's Improved "Finger" Bit

Get real gouging action in hard-to-take-hold-of medium ground! Get this Carboloy "Finger" bit . . . for strip and underground mining and other medium-ground drilling. Fits all standard auger drill heads using ½" bits. Check these plus values:

- **Faster cutting due to larger clearance angle on shank.**
- **Drills more freely.**
- **Less pressure is required.**
- **Uniform high quality throughout entire tip. Assures longer drill life.**

PLUS

- **Forged alloy steel shank—heat treated.**

Carboloy's Improved Auger Drill Bit

—for faster, easier drilling

An unbeatable coal drill—it's Carboloy's Auger Drill bit. Tipped with Carboloy Cemented Carbide—the hardest metal made by man—these bits will bite right into drilling costs, slash them left and right. Look at these big advantages—proven by actual field tests:

- **Maximum clearance and relief angles permit freer, faster cutting.**
- **Easier to use because less pressure required.**
- **Improved spiral prevents packing of coal cuttings.**
- **Uniform high-quality carbide throughout the entire tip. Assures longer bit life.**
- **Long tips of Carboloy Cemented Carbide permit many more re-grinds.**

PLUS

- **Forged alloy steel shank—heat treated.**

CARBOLOY® CEMENTED CARBIDE **FOR GREATER MINING ECONOMY**

MORE OUTPUT PER DAY. . . .

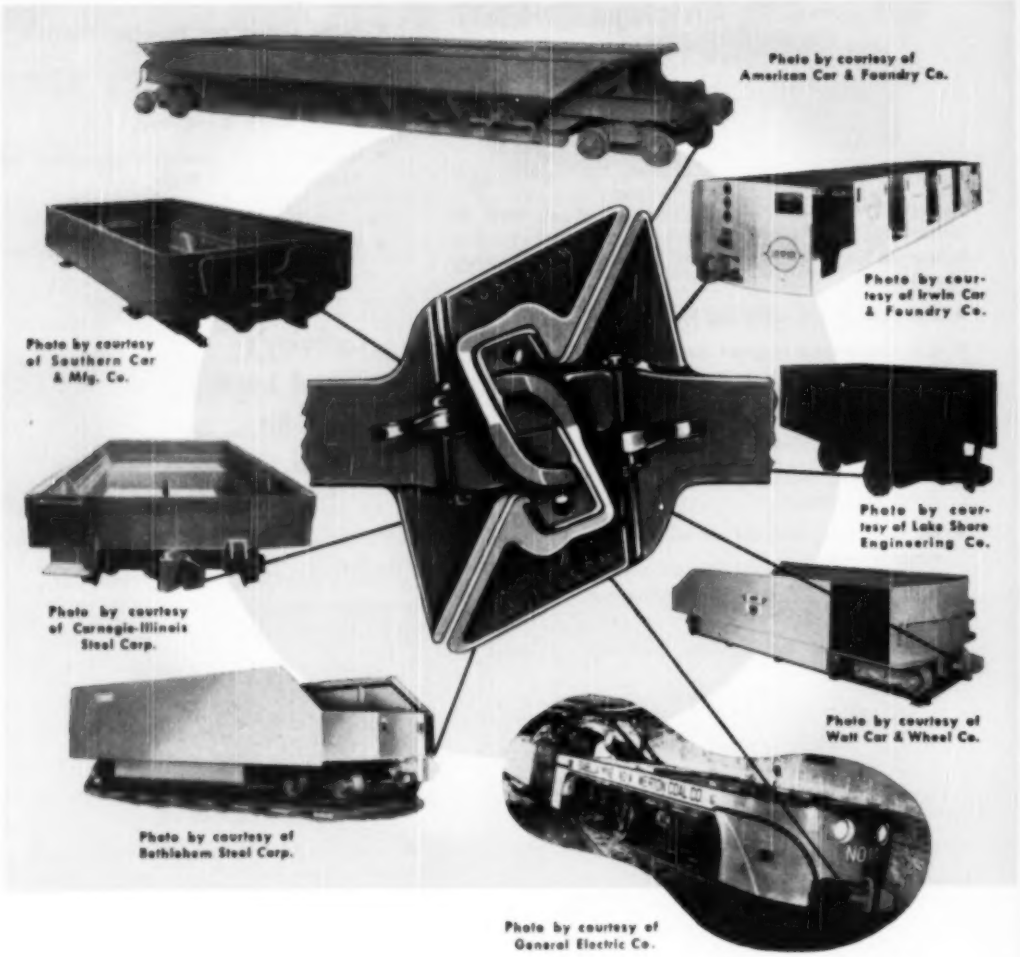

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Photo by courtesy of Irwin Car & Foundry Co.
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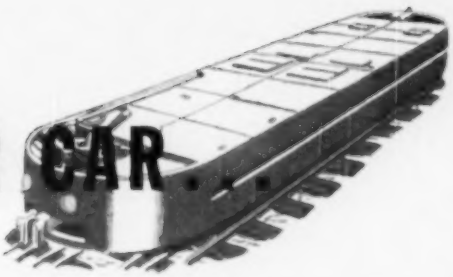
NATIONAL MALLEABLE AND

WILLISON AUTOMATIC COUPLERS • NACO STEEL WHEELS • NACO

PER MAN . . . PER CAR . . .



WITH WILLISON *automatic* COUPLERS

Large or small mine or industrial cars, in practically any kind of service, will move more tonnage per day, with maximum safety to workmen, when equipped with Willison Automatic Couplers.

For proof—ask any user about these advantages:

Maximum safety—automatic coupling requires no manual assistance. No need for workmen to go between cars when uncoupling.

Faster handling—all Willisons are alike in contour—can be coupled at either end of car or locomotive. No reversing necessary.

Smoother operation at higher speeds—close coupling eliminates damaging slack, allowing higher speeds with maximum stability and reduction of surging, spilling and danger of derailment.

To these advantages, add the substantial economies in maintenance of rolling stock, resulting from the simple, rugged construction of Willison Automatic Couplers. Two strong parts, the head and the lock, do the work and take the shocks and strains to protect cars and locomotives.

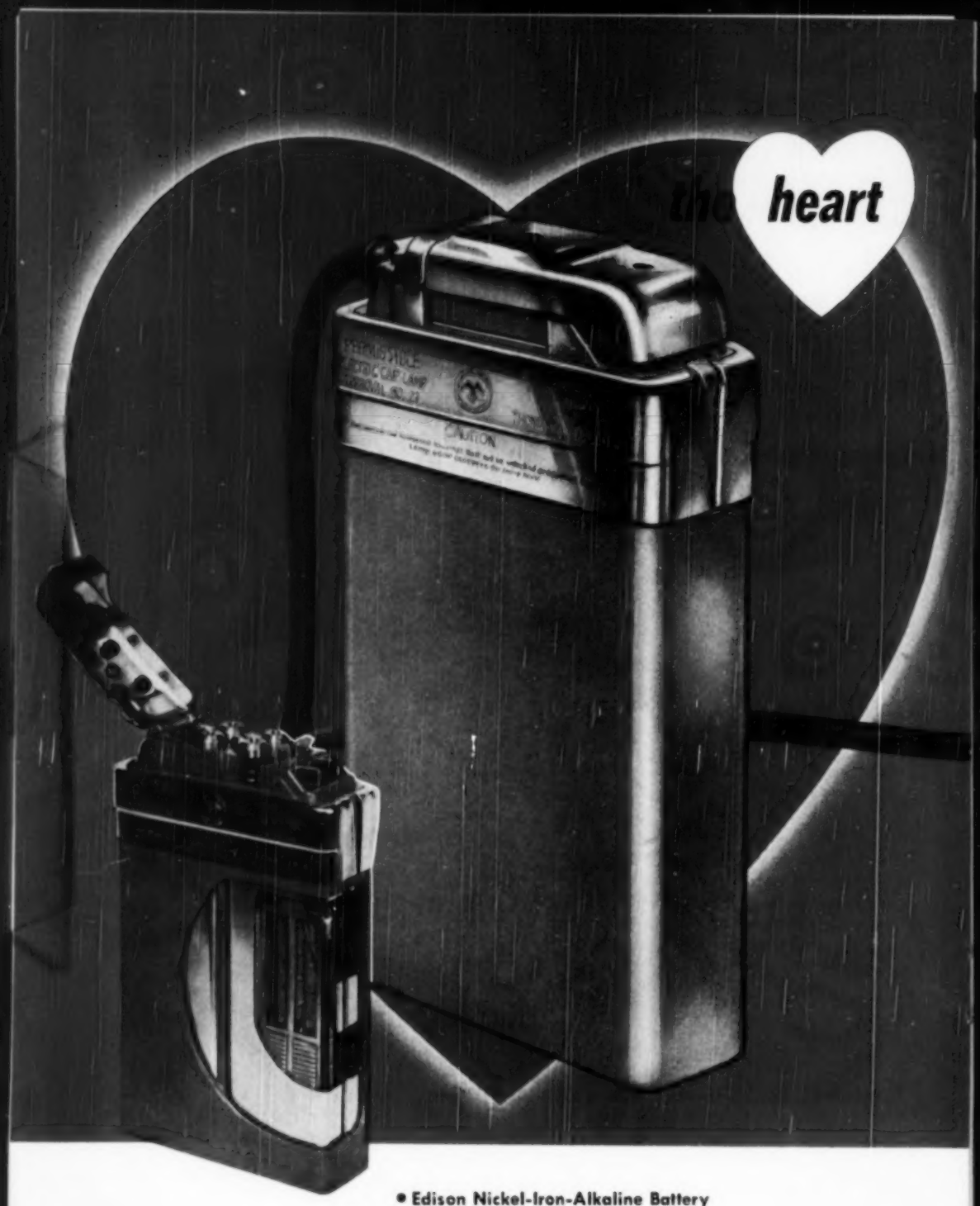
Ask for details on the application of Willison Automatic Couplers to your cars and your jobs—to enable you to handle more tonnage per day, with maximum safety.

Write for Circulars No. 1746 and No. 5240

NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY
Cleveland, Ohio

NATIONAL *Products*
FOR TRANSPORTATION AND INDUSTRY

STEEL CASTINGS CO.
STEEL LINKS AND SWIVEL HITCHINGS



- Edison Nickel-Iron-Alkaline Battery
- Welded Steel Cell Containers
- Tough Nylon Plastic Outer Case

# of Better Light for the miner

THE FAMOUS *Edison* BATTERY

The unfailing dependability of the Edison Electric Cap Lamp battery has been recognized since its introduction to the mining industry thirty-five years ago. Today, the Edison nickel-iron-alkaline battery continues to lead in every detail of construction and performance.

More light than ever before obtainable in a miner's lamp is a feature of the new Edison R-4 Battery. Cased in tough nylon plastic, with outer parts of stainless steel, the R-4 Battery is armored against rough usage. It is compact, well-balanced and easy to wear. *May we arrange an underground demonstration?*

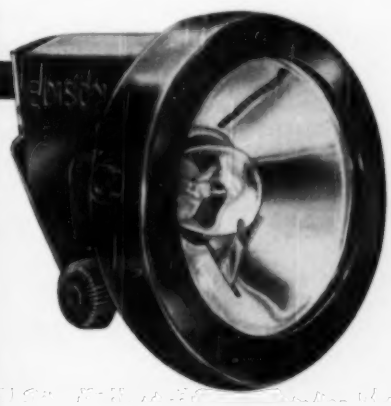
EDISON

MODEL

R-4

ELECTRIC CAP LAMP

Approved by U. S. Bureau of Mines



- Two-Filament Bulb
- Positive "Spot" Adjustment

MSA

SAFETY EQUIPMENT HEADQUARTERS

MINE SAFETY APPLIANCES COMPANY

BRADDOCK, MEADE AND MEADE STREETS . . . . . PITTSBURGH 8, PA.

At Your Service 48 BRANCH OFFICES in the UNITED STATES

IN ALL THE WORLD... NO WRENCH LIKE

ROXCO

it's individually **REGISTERED** *completely* **GUARANTEED!**

Special MONEY-BACK TRIAL OFFER!

Buy *one* "Registered" Roxco and use it for your toughest jobs. If you don't agree it stands up better . . . is handier, faster to use . . . is a bigger value than any pipe wrench you've ever used . . . return *that one* trial Roxco direct to us (not the seller), within sixty days with a note of price paid and reason for returning. We will refund your money. This get-acquainted offer good until Dec. 31, 1950. Trimont Mfg. Co., Roxbury, Mass.

ENGINEERED BY STRESS ANALYSIS TO ASSURE HEAVY DUTY STRENGTH WITHOUT USELESS WEIGHT

See dark Hardened area

Now you need not accept useless, fatiguing weight in order to get a dependably strong wrench. Through stress analysis of every inch, the new Roxco was designed to put *extra* metal *where heavy stresses come*. And, to take out metal where it does *not* count.

The result is not only the handiest pipe wrench a man ever put to work, but also a wrench so strong that it exceeds, by a good margin, Federal Spec's for Heavy Duty Pipe Wrenches, Type II, GGG-W-651a.

So superior is this new wrench . . . so carefully quality-controlled . . . that every Roxco is individually *Registered* by number. And *every* part is *guaranteed* against breakage in any normal heavy duty use! The nine points below show why any wrench buyer and user will want the lighter, easier-to-work-with Roxco to boost efficiency . . . reduce tool costs. Order Roxco, now. Or send for folder and names of distributors.

1. Extra Strength Based on Stress Analysis: Extra metal at critical points provides higher resistance to failure. Protects work and worker. Withstands unusual stress in "side pull".

2. Lighter Weight Achieved: Stress analysis also showed where useless metal could be eliminated to produce a lighter, handier wrench.

3. Uniformity of Jaw Hardness and Strength: Both movable and insert jaws are of drop-forged alloy steel. Teeth are hardened by automatically-timed, localized induction process at wear points, yet the tough core of jaws is retained for strength.

4. Reinforcing Shoulder Behind Insert Jaw resists any unusual stress. Assures long, trouble-free service.

5. Rapid Ratcheting Action: New, simplified cushion action replaces complicated spring. With Roxco tooth design, it prevents seizure on pipe and permits fast ratcheting action — as fast as user can move his hand. Accurate fit of assembled parts eliminates lost motion — speeds jobs.

6. Comfort-Shaped, Palm-Fitting Handle: New wide handle design is more comfortable to use — makes work easier, cuts worker fatigue.

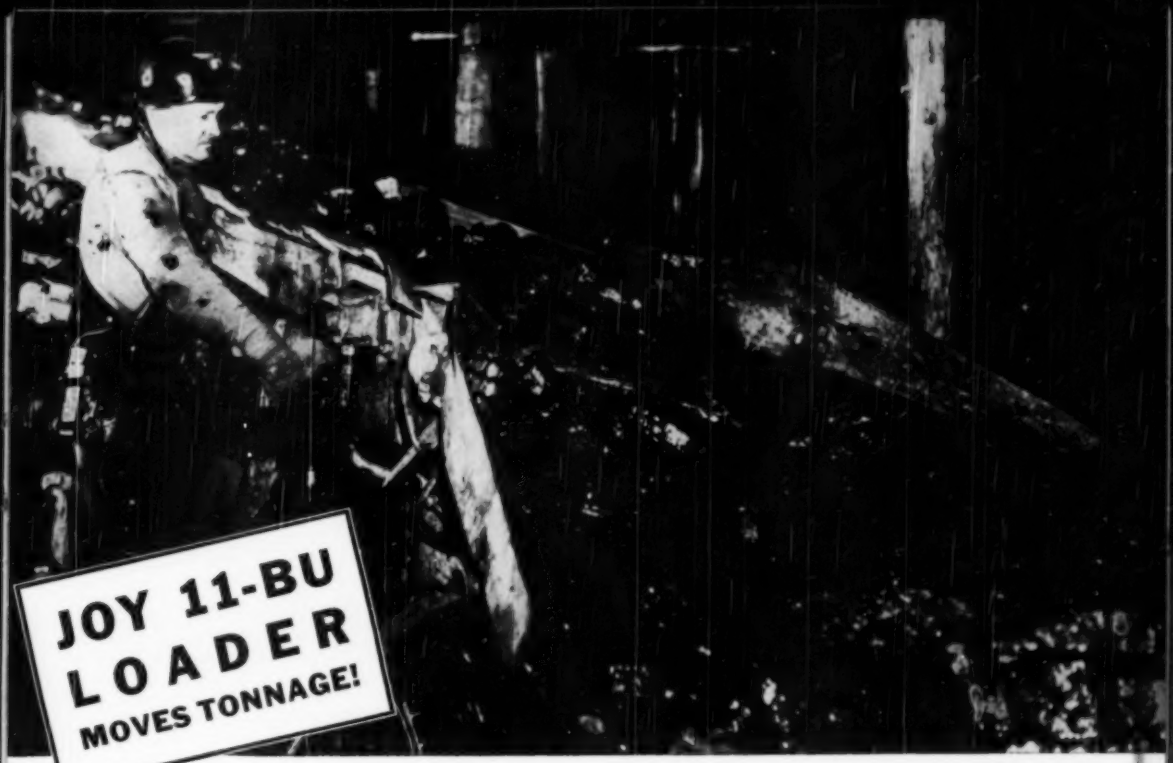
7. Reinforced Housing embodies a hammer face to break cast fittings.

8. Handy, Accurate Pipe Scale permits quick adjustment to desired size.

Special Metallurgical Formula: Roxco Metal, combined with scientific heat treating, means superior strength in housing and handle.

TRIMO-ALLOY WRENCH . . . Roxco's only Rival . . . is an all alloy-steel heavy duty pipe wrench. Different in design, but has power comparable to Roxco.

TRIMONT MANUFACTURING CO. Division of Aetna Industrial Corporation, 55 Amory Street, Roxbury 19, Mass. Makers of Wrenches, Pipe Cutters, Vises and Other Trimo Time-Tested Tools.



EFFICIENT JOY MACHINES

INCREASE PRODUCTION AND REDUCE COSTS

JOY CUTTERS, LOADERS and SHUTTLE CARS always mean more tonnage at less cost per ton . . .

Write for Bulletins, or

Consult a Joy Engineer

WADCL 2409

10-SC SHUTTLE CAR
New—heavy-duty—high-capacity

★

10-RU UNIVERSAL CUTTER

Licensed under the Patent to B. C. Morgan, No. 1,955,320

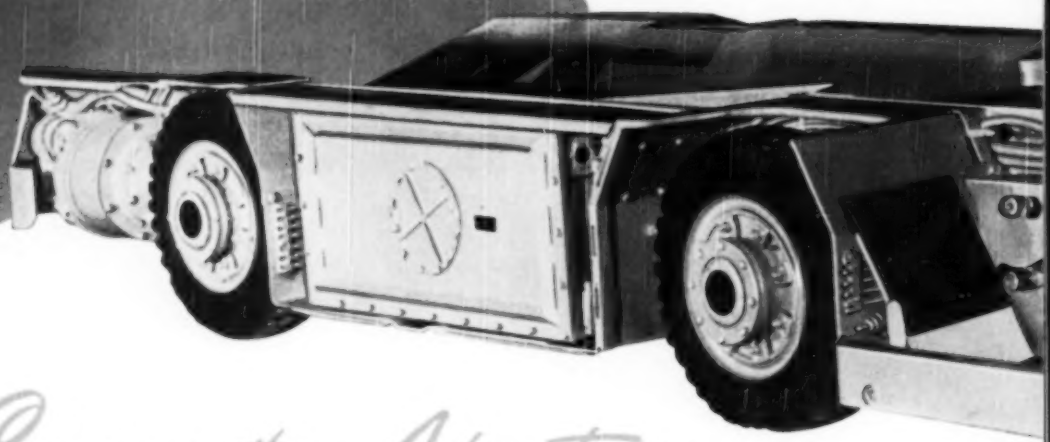
JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

Ahead of Anything in its class!

JOY'S 6-SC



Compare these Advantages—

Only the New Joy 6SC has them all . . .
All Developed by Joy Research, and Proved in the Field

DISC-TYPE BRAKES

The JOY 6-SC has smooth, positive braking action, without locking or grabbing. No adjustment is required for the entire life of the lining disc, since the braking area is automatically compensated for wear. JOY Disc-type Brakes can be re-lined four times as fast as internal-expanding brakes, have far fewer parts, and are unaffected by dirt, coal dust, oil or water.

EXTRA-LONG WHEEL BASE

Less pitching when tramming over rolling bottom, due to its extra-long wheel-base, permits the JOY 6-SC to operate with a minimum of roof clearance. This highly modern low-seam shuttle car is inherently more stable and can operate in thinner coal than other cars of equal capacity.

SAFETY DIRECTIONAL CONTROL

In the 6-SC, the operator must face the direction of travel to operate the tramming motors, minimizing the risks that can occur in shuttle cars lacking this safety feature.

DOUBLE-SAFE STEERING

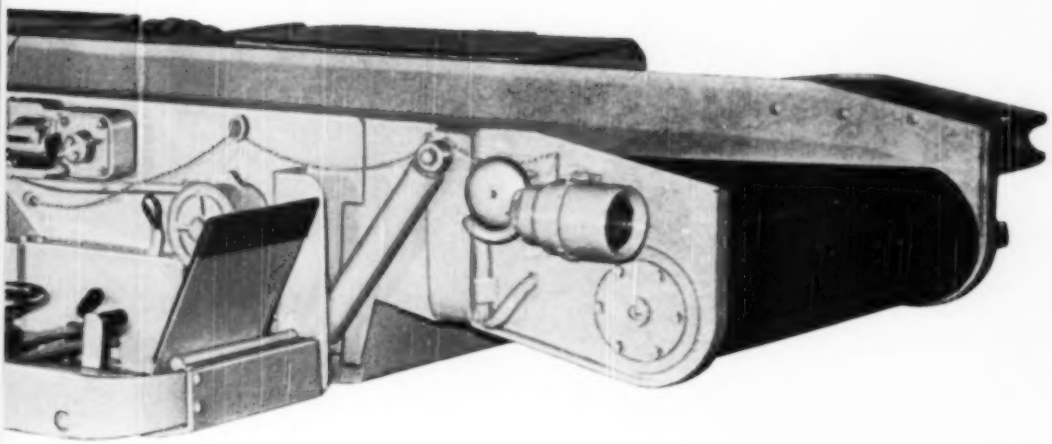
JOY Shuttle Cars are equipped with hydraulically-boosted mechanical steering—much safer than straight hydraulic, and much easier to control than straight mechanical steering. If hydraulic pressure is lost on JOY Cars, the operator still has complete control mechanically. Also, a JOY Car has steering "feel," like an auto . . . the wheels turn farther or less as the control is moved farther or less.

EXCLUSIVE SAFETY SEAT

A desirable feature in low-seam operation—the operator's seat in the JOY 6-SC tips back and "straightens out" when light force is applied to the top of the back of the seat, placing the operator in an unrestricted position in emergency.

1950 MODEL

SHUTTLE CAR



MERCURY-TUBE CONTROLLER

JOY Shuttle Cars are equipped with patented *Magnetax Control*—specifically designed and built for mining duty, not adapted from industrial control. This control employs sealed, mercury-tube interlocks for tramming and accelerating. These interlocks are unaffected by dirt, moisture, acid condensation, fumes, etc., and inevitably require less maintenance than any mechanical type of interlocks.

PLASTIC-FILLED MOTOR ARMATURES

This feature in JOY Cars reduces maintenance and motor failures because it assures the best electrical insulation and firmly bonds the armature coils in place. The coils are prevented from shifting because of vibration, or because of the rough usage imposed by constant reversing in shuttle car service.

EXTRA-LARGE CABLE REEL

The larger cable capacity of the JOY 6-SC permits it to operate over longer distances than other cars in its class. Also, the JOY Cable Reel is 2-step hydraulically driven for smoother, more reliable operation.

ADDITIONAL FEATURES

- **Four-Wheel Steering**
- **Four-Wheel Drive . . . Positive Drive on each wheel assures traction under worst bottom conditions.**
- **Two-Speed Controllable Tramming**
- **Hydraulically-Adjustable Elevating Discharge**

Write for Bulletin, or *Consult a Joy Engineer.*

W&D CL 2008

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

One man can drill 50% MORE HOLES in less time and with far less effort—with

JOY Roof-Bolting Drills and Mine-Air Compressors—available in a complete range of types and sizes to meet any requirement—are backed by more than 50 years of drill and compressor-building experience.

the NEW JOY RUBBER TIRE-MOUNTED ROOF-BOLTING DRILL

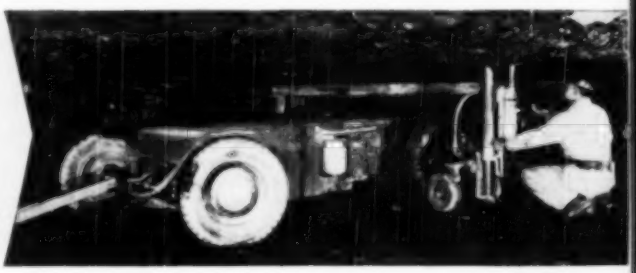
★ **Highly Mobile and Flexible.**

★ **Greater stability ... and the *one* JOY Drill does your *entire* Roof Bolting job—drills the hole, drives the bolt and tightens the nut.**

The other half of your Roof-Bolting Team

JOY MINE-AIR COMPRESSORS

Compact • Mobile • Highly Efficient



Write for Bulletins, or *Consult a Joy Engineer*

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

1st because proved BEST

THERE'S just one reason why more tons are hauled on Goodyear tires than on any other kind. It's because cost-conscious, profit-minded haulers have found from experience that these great tires are unequalled for mileage, dependability and low cost-per-mile.

To cut *your* hauling costs, remember to BUY and SPECIFY Goodyear — Goodyear tires are the No. 1 tires with haulers the world over!

GOODYEAR
HARD ROCK LUG
ROAD LUG
For trucks that operate both OFF- and ON-the-road this dual-purpose tire is best. Tough construction and special tread design provide super-traction off the road—more mileage on the road.
HARD ROCK LUG
For tire-bruising, heavy-duty off-the-road work this super-rugged tire is tops. Its tough-armored carcass, extra-husky lugs assure more wear, better performance no matter how tough the going is.

Reg. U.S. Pat. Off. — T.M. The Goodyear Tire & Rubber Company

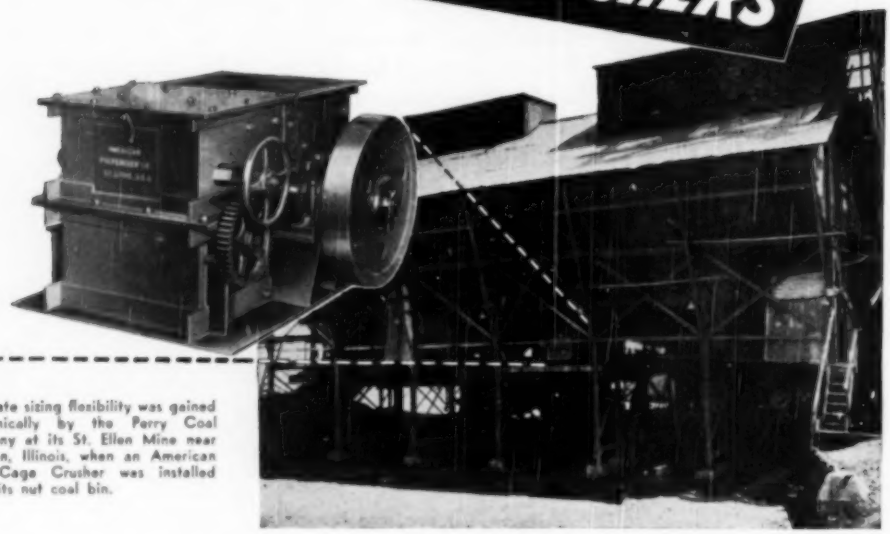
We think you'll like "THE GREATEST STORY EVER TOLD" — Every Sunday — ABC Network

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TIRES THAN ON ANY OTHER KIND

Get FLEXIBILITY of SIZING for fast-changing market needs . . .

with . . . AMERICAN Drop Cage CRUSHERS



Adequate sizing flexibility was gained economically by the Perry Coal Company at its St. Ellen Mine near O'Fallon, Illinois, when an American Drop Cage Crusher was installed under its nut coal bin.

Rapidly fluctuating market requirements are no problem to operators where American Drop Cage Crushers are on the job. They're designed especially for the secondary step in the full range of reduction to add flexibility to coal preparation.

UNIFORM HIGH TONNAGE AT LOW COST—Size control is continuously maintained with a minimum of undesirable fines—and no oversize—to assure uniform high tonnage output of the most marketable sizes. And by reducing at low, power-saving speeds, Americans offer additional savings in operating costs.

EASY, ECONOMICAL INSTALLATION—Engineered to fit right under the bin, with extremely low headroom requirements including bypass, compact Americans assure minimum installation costs without extensive plant alterations.

Patented *Shredder Rings* reduce coal by *controlled cleavage* instead of blunt shattering force—the basic reason for the greater size uniformity achieved by Americans.

With capacities from 50 to 500 TPH, there's an American Crusher custom-built to make your coal marketing more profitable.

Get the Facts . . . Write for Coal Crushing Bulletins

American PULVERIZER COMPANY

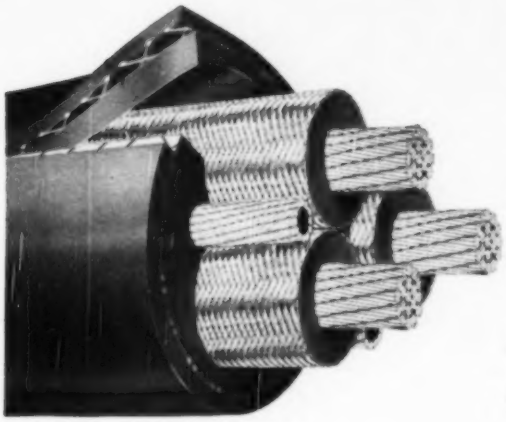
Originators and Manufacturers of Ring Crushers and Pulverizers

1119 Macklind Avenue
St. Louis 10, Mo.

It's Butyl-Insulated!

SECURITYFLEX type SHD

Better for your high-voltage, heavy-duty big shovel jobs!



The newly improved Securityflex® Type SHD is better because it's BUTYL-INSULATED for superior electrical and mechanical characteristics. It stands up better under compression and mechanical abuse, has increased moisture resistance and much higher heat resistance (rated at 80°C.).

Better because it has a new "copper-cotton" combination shield that

- **means faster, easier splicing**
- **eliminates chafing failures**

Better because the patented grounding wires are rubber-cored. That means grounding wires that

- **will not kink**
- **have larger diameter for greater contact with conductor shield**
- **provide cushioned construction that won't cut insulation**

It all adds up to a much more rugged shovel cable. For more information on Securityflex Type SHD, get in touch with your nearest Anaconda Sales Office or Anaconda Distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York. 50514

•Reg. U. S. Pat. Off.

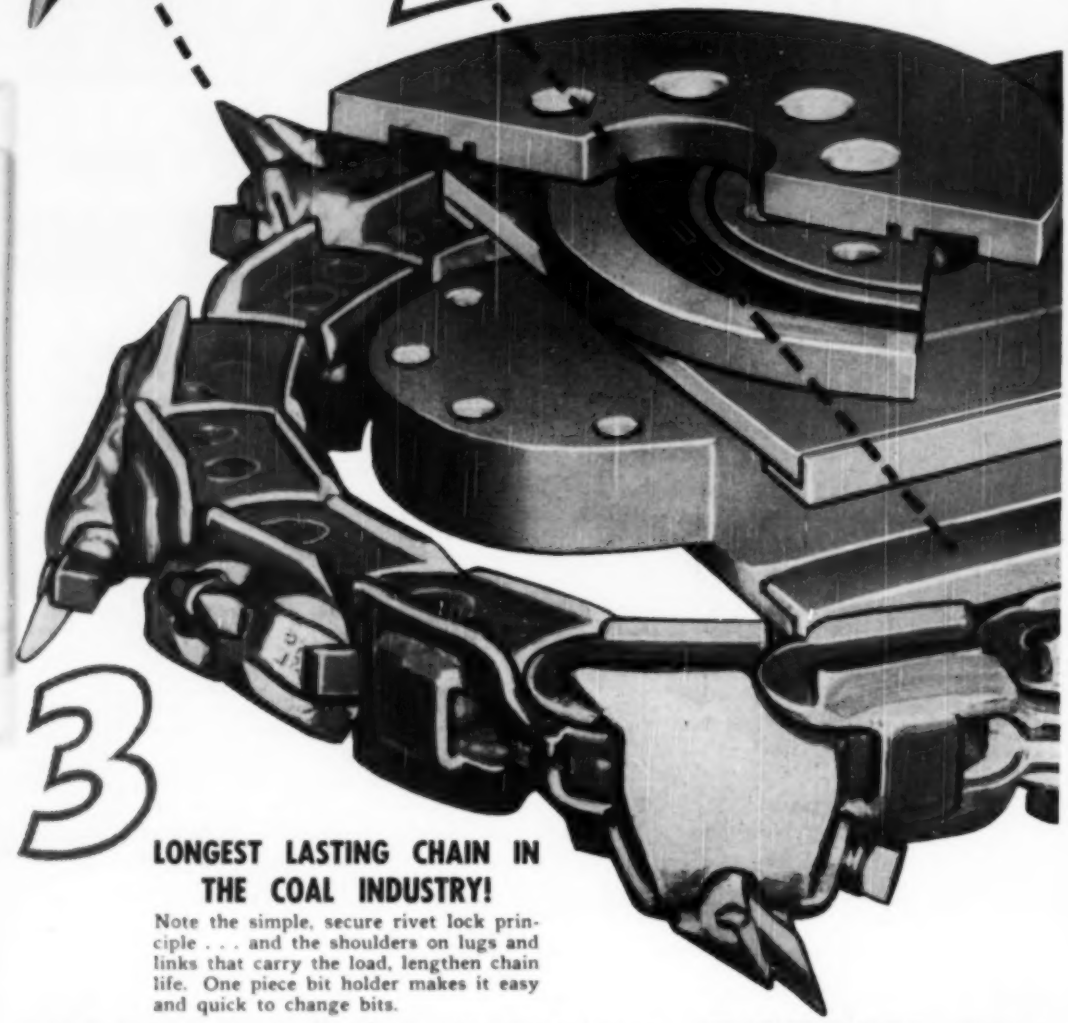
the right cable for the job ANACONDA®

WIRE AND CABLE

BOWDIL BITS save money in any cutting operation. So inexpensive, it doesn't pay to re-sharpen bits. Bowdil Bits use less power, give more profitable coarse cuttings. Many imitators . . . no equals.

2 LOOK AT THE STRENGTH OF THIS BAR

All welded construction, sturdy hardened angle wearing strips give wobble free run. The strongest cutter bar made, available to fit most every type of shortwall, longwall, arcwall and track cutting machines of all popular makes.



3 LONGEST LASTING CHAIN IN THE COAL INDUSTRY!

Note the simple, secure rivet lock principle . . . and the shoulders on lugs and links that carry the load, lengthen chain life. One piece bit holder makes it easy and quick to change bits.

SALES ENGINEERS IN — Whitesburg, Kentucky — West Frankfort, Illinois Charleroi, Pennsylvania — Denver, Colorado — Big Stone Gap, Virginia Danville, West Virginia — Canton, Ohio — Birmingham, Alabama Helper, Utah — Kansas City, Missouri — Centerville, Iowa — Topeka, Kansas — New Castle, England — Alberta, Canada

BOWDIL CANTON OHIO
COAL CUTTING EQUIPMENT

How to cut loading time and repair costs...

SUPERLA Mine Lubricants have reduced loader-clutch repair costs as much as 50% in midwest mines. They have eliminated delays for "warming up" loaders. They have made possible easier and faster loading. Here's why they will assure similar benefits for you:

Superla Mine Lubricants keep transmission cases clean. Clutches operate easily with no gumming or coking caused by oil deposits. When machines are started, these lubricants flow readily between clutch plates, *protect them against wear, eliminate "clutch drag" and the necessity for warming up loaders.* During long periods of continuous operation, Superla Mine Lubricants do not thin out excessively, provide safer lubrication for clutch plates.

A test of Superla Mine Lubricants will prove their ability to keep your loaders on the job longer with less maintenance. These products are available in oil and grease grades suitable for any type of cutter or loader. A Standard Oil Lubrication Engineer will gladly help you select the proper grades for your equipment.

Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

SIX GRADES FOR LUBRICATING ANY TYPE OF CUTTER OR LOADER

No. 00. An oxidation-inhibited oil containing a detergent additive. It provides exceptionally clean operation and low oil consumption for oil-lubricated gear cases.

No. 0. A high-quality additive-type oil similar to No. 00 but of a slightly heavier grade. It is designed for Goodman loaders and cutters.

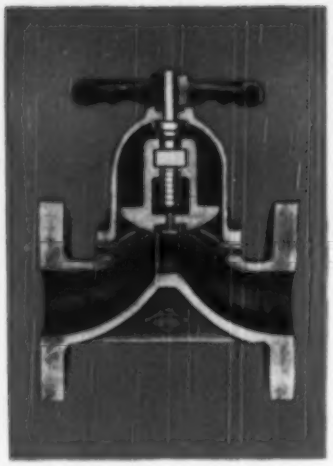
No. 2. A soft, semi-fluid grease for lubricating gathering-head gear cases where greater fluidity is desired than that usually provided by most loader greases.

No. 4. A semi-smooth grease particularly resistant to thinning out under heat and mechanical working. At the same time it can easily be poured from the barrel bung at ordinary mine temperatures. It is especially designed for Joy loaders.

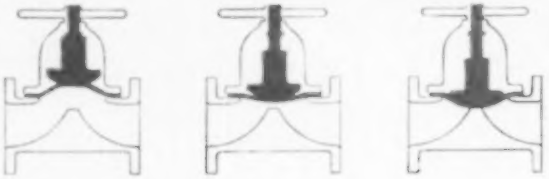
No. 6. A grease of heavy consistency and good high-temperature characteristics. Its fibrous structure makes it particularly useful on mine car wheels and for general underground lubrication.

No. 8. A smooth grease having superior high-temperature characteristics. It is suitable for armature bearings and pressure-gun work where a grease of heavy consistency is desired.

STANDARD OIL COMPANY (INDIANA) STANDARD

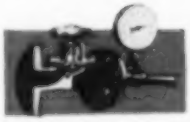


If you need a diaphragm valve you need all the advantages of diaphragm closing



Check these popular features of

GRINNELL-SAUNDERS DIAPHRAGM VALVES



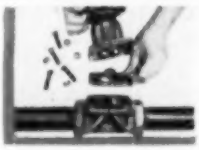
Diaphragm gives leak-tight closure against grit, scale, solid matter . . . Even when something as substantial as an 8-penny nail is trapped on the weir of a rubber lined valve, as illustrated, the resilient diaphragm, plus the large area of contact, gives leak-tight closure against pressure or vacuum.

Diaphragm lifts high for streamlined flow in either direction . . . Smooth, streamlined passage, without pockets, prevents trapping of sludge and reduces frictional resistance to a minimum—irrespective of direction of fluid flow. No disc holder in fluid stream. Grinnell-Saunders Diaphragm Valves are self-draining when installed with the spindle at 15 degrees above the horizontal position.

Diaphragm absolutely isolates working parts from fluid . . . There's no "if" about the way a continuous, one-piece diaphragm seals off the working parts from fluids; no perforation or puncture in the diaphragm where fluid or gas can possibly leak by the valve spindle. No sticking, clogging or corroding of working parts. Valve lubricant cannot contaminate the fluid in the line.

Diaphragm, body and lining materials to meet particular conditions . . . Bodies stocked in cast iron, malleable iron, stainless steel, bronze and aluminum: other materials on special orders. Valve bodies lined with lead, glass, natural rubber or neoprene. Diaphragm materials of natural rubber or synthetics. Working pressure, 150 lbs.; maximum temperature, 180 °F.

Diaphragm is only part that normally wears and needs replacement . . . Depending on the type of service, it may last for years, particularly since the compressor and finger plate combine to support the diaphragm in all positions. The diaphragm can be replaced quickly without removing valve from line. No refacing or reseating. No disc holder to require tightening or replacing. No packing glands to demand attention.



Write today for the new Grinnell-Saunders Diaphragm Valve Catalog 4-S.

100 - ANNIVERSARY — PIPING

GRINNELL

Grinnell Company, Inc., Providence 1, R. I. Warehouses: Atlanta • Buffalo • Charlotte • Chicago • Cleveland • Cranston • Fresno • Kansas City • Houston • Long Beach Los Angeles • Milwaukee • Minneapolis • New York • Oakland • Philadelphia • Pocatello • Sacramento • St. Louis • St. Paul • San Francisco • Seattle • Spokane

CUT COAL UNLOADING COSTS 2 WAYS

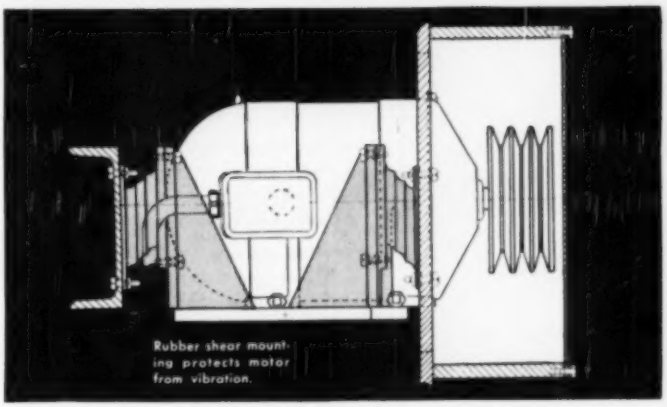
ALLIS-CHALMERS CAR SHAKER

1. SAVE MAN-HOURS

In just a few minutes a hopper-bottom carload of coal screenings can be emptied with the new Allis-Chalmers Car Shaker. Labor is saved at the unloading station. Expensive demurrage costs may be avoided!

2. SAVE MAINTENANCE

Simplified mechanism has minimum of working parts to maintain. Driving motor is 15 hp, high-torque, totally-enclosed... mounted on rubber to protect against vibration! (Note rubber motor mount at right) Steel body is stress-relieved.



Rubber shear mounting protects motor from vibration.

HERE'S A CAR SHAKER that is built to withstand severe vibration necessary for fast unloading of bridged and packed coal from hopper-bottom cars.

Its simplified mechanism . . . its unique arrangement for hydraulically removing self-aligning bearings for replacement purposes . . . and *many* other features pay off in low maintenance and long service!

Bulletin 07B7221 gives you more facts. Contact your nearby Allis-Chalmers Sales Office. Or send in the handy coupon.

ALLIS-CHALMERS, 968A SO. 70 ST.
MILWAUKEE, WIS.

A-2909

Please send Car Shaker Bulletin 07B7221.

Name_____

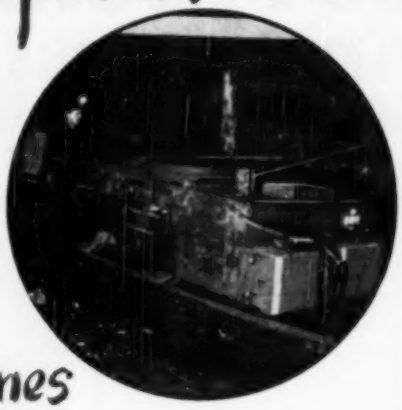
Title_____

Firm_____

Address_____

ALLIS-CHALMERS

For Surface Mines...



...For Underground Mines

...A SAFE, DEPENDABLE CABLE FOR SIGNAL AND CONTROL CIRCUITS.

In open air or underground, Simplex - ANHYDREX Signal and Control Cables have what it takes to provide safe, trouble-free service under all operating conditions.

Anhydrex SA insulated and neoprene jacketed, they provide:

Excellent Electrical Properties
- — High dielectric strength
- — Low power factor
- — Low dielectric constant

Protection Against Operating Hazards
- — Water and moisture
- — Grease and oils
- — Heat and sunlight
- — Bad weather
- — Rough handling

Safe Operation
- — Anhydrex SA insulation has stable electrical properties and is physically durable to withstand rigorous service. The neoprene jacket is especially tough and it will not support combustion.

Simplex-ANHYDREX Signal and Control Cables have no metallic coverings to crystallize and corrode; are not harmed by vibration and stray currents. They are flexible, lightweight, and small in diameter; easy to install, splice, and terminate.

SIMPLEX-ANHYDREX

WRITE FOR CATALOG 1013

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.

"Around here, we never waste a dime"

"We check the cost of everything. Compare brands, run tests. Wire rope? Sure we check on rope — performance, life, costs of the actual work it does. That way, it's possible to tell which brand is cheapest in the long run."

Smart buyer! His records have shown him that cost per unit of work, not purchase price, is the only sound basis for calculating rope expense.

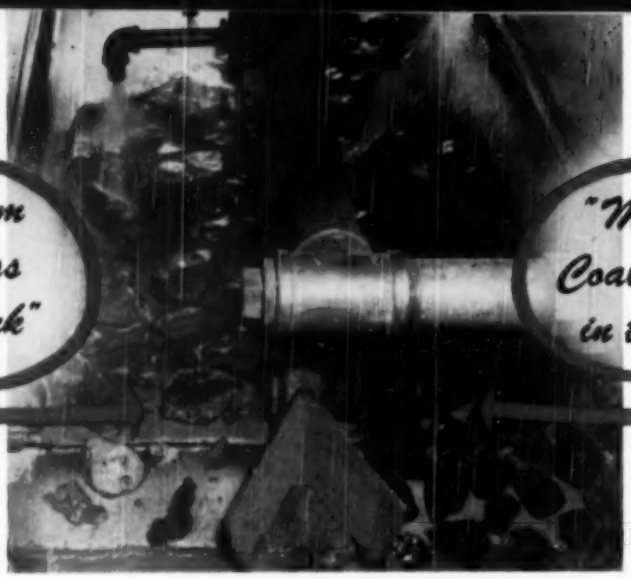
His records have shown him, too, that whenever he specifies Bethlehem rope, he's making a solid buy . . . one that will give him his money's worth and more. There's no finer rope made — a fact that you yourself can easily verify.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM WIRE ROPE
BETHLEHEM STEEL

When you think WIRE ROPE . . . think BETHLEHEM



HEAVY-MEDIA SEPARATION RECOVERS MORE COAL PER TON OF RAW FEED THAN OTHER CLEANING METHODS

You've mined it, hauled it, crushed it, screened it. Loaded in a hopper car, a ton of clean coal is worth up to $7.00. Dumped on the refuse bank, that coal is a net loss of your cost plus your profit!

Yet inefficient cleaning units can fail to recover two (or more) tons of saleable coal from every hundred tons washed, according to the published figures of a well-known coal preparation authority in a recent technical article comparing the performance of Heavy-Media Separation and earlier washery equipment.

How can you check the recovery performance of your cleaning equipment? *Before* you install any new cleaner, how can you be sure that you will get maximum recovery of shipping-grade coal?

By having an independent testing laboratory run "heavy liquid" tests on your feed coal and, if you now clean, on your refuse. By comparing what you can ship using ordinary washers with what you can ship if you use Heavy-Media Separation—the only cleaning process that closely duplicates "heavy liquid" results over a full size-range at any gravity from 1.25 to 2.00.

Remember, the difference in recovery between Heavy-Media Separation and inefficient cleaners for a total-seam mechanized operation can mean as much as $20,000 per year additional revenue for every 100 tons per hour capacity.

Remember, that Heavy-Media Separation units are operating profitably on the middlings and refuse from previously installed mechanical cleaners.

Remember, also, that many of the newest preparation plants (including an ultra-modern coking coal washer of 25,000 tons

per day capacity) use Heavy-Media Separation . . . that soon every tenth ton of American coal cleaned will be efficiently processed to exact, pre-determined specifications by Heavy-Media Separation.

Why has the use of Heavy-Media Separation grown so fast?

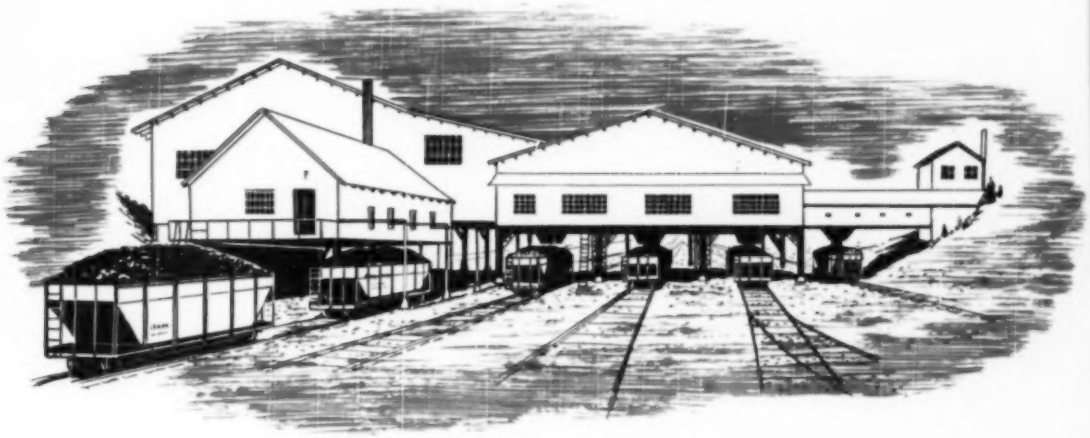
BECAUSE – Heavy-Media Separation makes an infallible separation of "pre-determined specification" coal even from near-gravity refuse by reason of the exceedingly small differences in their specific gravities. This is extremely important where a large percentage of near-gravity material is present.

BECAUSE – Heavy-Media Separation is the only coal cleaning process that provides automatic, continuous and complete removal of large and variable amounts of refuse without volumetric limitation.

BECAUSE – Heavy-Media Separation makes an amazingly sharp separation . . . maintains the desired separating gravity within ± 0.01 . . . never changes its separating efficiency because of intermittent feed or a sudden increase in the refuse content of the raw coal.

No other process even closely approximates this combination of economy, high recovery and range of applicability!

To operate profitably in the competitive days ahead, you should investigate now what Heavy-Media Separation can do for you—either alone or as an adjunct to your existing washer. Pre-fabricated plants with capacities up to 300 tons per hour are available for speedy erection. Well-known engineering firms can quickly design custom-built plants to meet any operating condition. Capital cost is low, operating cost definitely in line with less efficient preparation methods. Equipment is standard and proved by millions of tons of operation. Cyanamid stands ready to help with unprejudiced counsel, the testing services of the Cyanamid Mineral Dressing Laboratory and Pilot Plant as well as the practical help of Cyanamid Field Engineers in tuning up your unit for maximum recovery of specification fuel.



AMERICAN *Cyanamid* COMPANY

MINERAL DRESSING DIVISION

30 ROCKEFELLER PLAZA NEW YORK 20, NEW YORK

PIPING EQUIPMENT FOR MINE SERVICES

...FROM ONE COMPLETE LINE

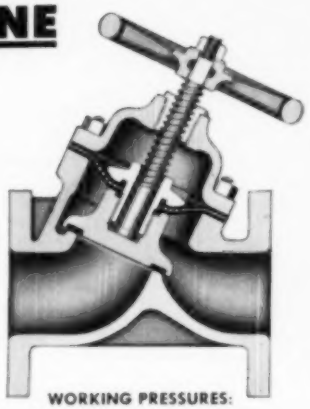
BETTER PERFORMANCE FROM DIAPHRAGM VALVES

Note how, in this new Crane design, the diaphragm is used only to seal the bonnet area—not for seating purposes. Service life of the Crane diaphragm is greatly increased because it isn't subject to cutting, crushing, and rapid wear.

The disc is a separate member which assures accurate seating and positive shut-off of flow—even in case of diaphragm failure. Other outstanding features of Crane design are greater flow capacity and easier operation in all sizes.

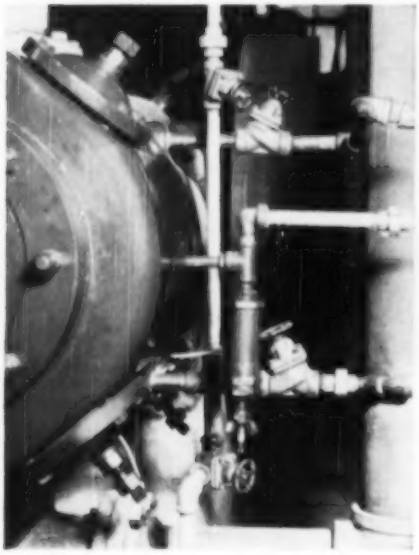
For mine waters, sludges, and slurries corrosive to iron, Crane supplies these valves with Neoprene lining. Unlined valves are highly suited for compressed air and other common mine services. Available in sizes up to 6 in.; screwed or flanged ends. Send for Circular AD-1761.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas



WORKING PRESSURES:
Up to 150 pounds water, oil, air, or gas; 180° F. max. temp. Sizes up to 6 in. Screwed or flanged ends.

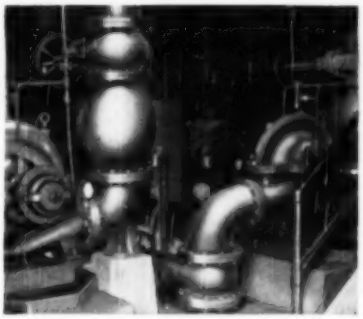
ONE ORDER TO CRANE COVERS EVERY POWER, PROCESS, OR GENERAL UTILITY PIPING NEED



DRAINAGE LINES *in a metal mine equipped with iron valves and fittings from the complete Crane line.*

LINES TO AIR COMPRESSOR *using Crane No. 1610 Iron Body Diaphragm Valves.*

PRIMARY SPRAY PUMPS *in a Large breaker plant featuring Crane 125-Pound Iron Body Wedge Gate and Check Valves.*



EVERYTHING FOR EVERY PIPING SYSTEM

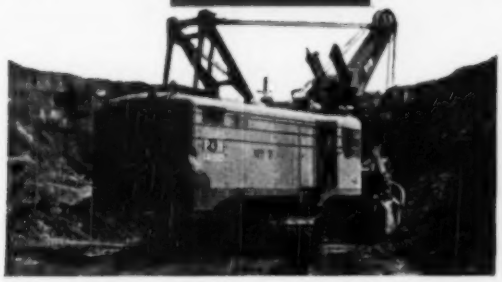
CRANE

VALVES • FITTINGS • PIPE • PLUMBING AND HEATING

PRODUCTION IS UP!

COSTS ARE DOWN!

WITH P&H ELECTRIC SHOVELS . . .



. . . at the Steep Rock Iron Mines in Canada. Here, the first P&H Model 1400 (4 cu. yds.) was quickly followed by two more.

Bigger tonnage at lower cost . . . that's the real test. And there's where you'll find the P&H 1400 leads the way with such features as the Magnetorque* which electro-magnetically powers the hoisting motions . . . *smoother, faster,* and more *dependably.* Quicker move-ups by independent propel add *more* tonnage. Stepless electrical control saves time by eliminating *all* contactor troubles. These and many other P&H features combine to give you increased production. Greater production means greater profits for you. Write, today, for information.

*Trade-mark of Harnischfeger Corporation for electro-magnetic type clutch.

Every third P&H electric shovel sold is a repeat order.

P&H ELECTRIC SHOVELS
4540 West National Avenue
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION

PLAN AHEAD

Photographs show the modern Connellsville Tipple recently installed for the Maryland Century Coal Co., Century, W. Va.

Picking table for meeting present needs.

Provisions for installing coal washer when production demands it.

TIPPLES Designed and Built for Your FUTURE Needs.

Modern coal markets place the responsibility upon operators for preparing coal efficiently and profitably. Plan ahead—take advantage of a modern preparation plant designed to meet your present and future capacities.

The Connellsville Manufacturing & Mine Supply Co. specializes in the answer to your coal preparation needs. Our modern tipples are designed with allowances for incorporating additional equipment and facilities when future capacities demand it, in addition to giving you the utmost recovery at your present capacity.

Eliminate costly maintenance and repair expense on old tipples—plan ahead now with a modern Connellsville coal preparation plant. Our experienced engineers and manufacturing facilities can aid you in designing and erecting a plant to economically fit your needs. Write for details.

We also manufacture: CONVEYOR SYSTEMS, SHEAVES, COAL AND SLATE LARRIES, ROTARY DUMPS, HOISTS, HAULAGES, SKIPS, CAGES, COKE OVEN EQUIPMENT and Other Allied Equipment.

CONNELLSVILLE
MANUFACTURING & MINE SUPPLY CO.
CONNELLSVILLE, PA.

"Serving the Mining Industry since 1901"

How to avoid application errors at the face:

use { Gulf Mining Machine Lubricant B
for lubrication - it does the job of 2 or 3 other lubricants

Gulf Journal Oil B
for hydraulic systems

With Gulf Mining Machine Lubricant B and Gulf Journal Oil B you can service almost any mining machine—and you eliminate as many as 4 oils and greases! Thus your lubricant storage and handling are greatly simplified and you avoid application errors at the face.

Gulf Mining Lubricant B and Gulf Journal Oil B not only do the job of several other oils and greases, but do it better! Gulf Mining Machine Lubricant B has a heavy body to insure less leakage from gear cases; exceptional adhesiveness that prevents throwoff or channeling; higher lubricating value that insures less wear; and it resists the washing action of water.

Gulf Journal Oil B gives outstanding protection to hydraulic pumps—helps maintain system efficiency!

Call in a Gulf Lubrication Engineer today and ask him to explain in detail how these two Gulf quality products for cutting and loading machines can give you effective help in your efforts to increase tonnage and reduce costs. Write, wire, or phone your nearest Gulf Office.

Gulf Oil Corporation · Gulf Refining Company

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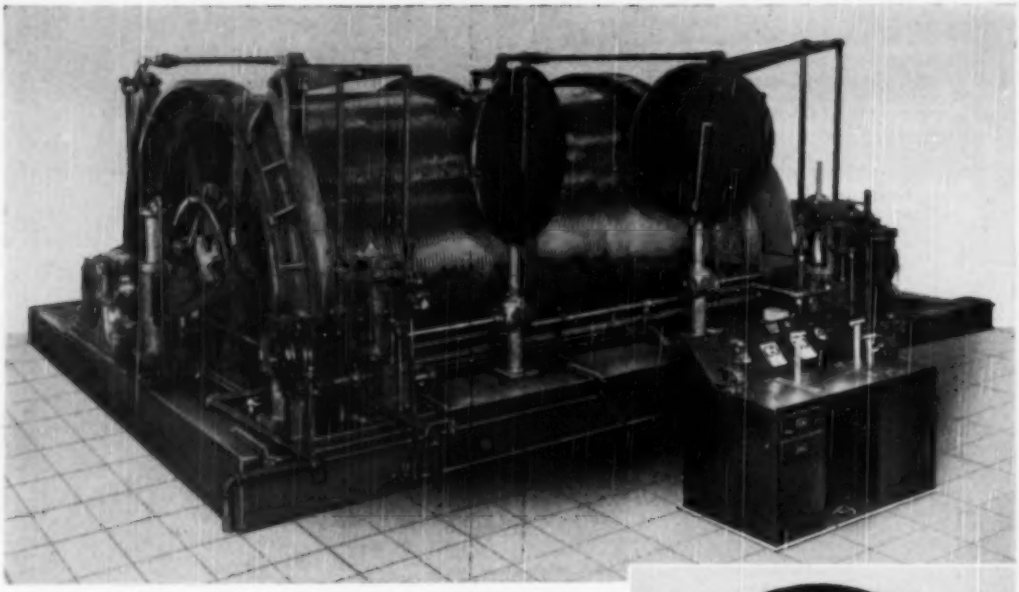
Sales Offices - Warehouses
Located in principal cities and towns throughout
Gulf's marketing territory

GULF INDUSTRIAL LUBRICATION



Roller Bearings Minimize Friction In This Modern VULCAN Hoist

Designed and built to meet the specific requirements of a well-known metal mining company, the hoist shown above, assembled in a Vulcan shop, "has everything" to promote fast, safe, convenient operation.

When installed, it will be driven by dual 250 hp. motors through flexible couplings and single-reduction herringbone gears running in oil. The main shaft and both of the two pinion shafts are mounted in spherical-roller-bearing pillow blocks to minimize friction and assure permanently accurate alignment. All operating levers and instruments are grouped at a control desk on the floor level, providing SIMPLIFIED EFFORTLESS CONTROL.

Other modern equipment includes parallel-motion post-type brakes on each drum and a toothed-type positive clutch on one drum. Brake and clutch engines are operated by oil-hydraulic pressure. Brake and clutch on the loose drum are mechanically and electrically interlocked.

The all-steel "built-up" drums are 10'-0" diam. by 6'-2" face with machine-cut grooves for 1609 feet of 1⅜" rope in one layer. Each drum is equipped with a gear-driven safety controller which provides complete protection for hoisting from several different levels.

Your operating conditions may require an entirely different type of hoist but Vulcan's experienced engineers will welcome an opportunity to submit an equally suitable design. No charge or obligation—just give us the necessary data.

VULCAN ALLCASTEEL SHEAVES

WITH ROLLER BEARINGS

were furnished for use with this hoist and for other hoists operated by the same company. The sheave here illustrated is 10 ft. pitch diam., grooved for 1⅜" rope and equipped with tapered roller bearings in the hub. The "dead" shaft is held in clamp-type steel pedestals. Light, strong, true-running and so highly resistant to rope wear that NO LINERS ARE NEEDED, Vulcan Allcasteel Sheaves have proved their money-saving superiority for every type of heavy-duty service. Bulletin A-396 (20 pages, fully illustrated) gives complete information.

Vulcan Iron Works

Established 1849

WILKES-BARRE, PA., U.S.A.

Cable Address "Vulworks Wilkes-Barre"

Manufacturers, also, of Underground Conveyors and all types of Electric Locomotives for underground service.

These Two Valuable "Tools" of

V-BELT DRIVE

Design and Application

. . . are *Yours* for the *Asking!*

The Gates "GUIDE for SELECTING or DESIGNING V-BELT DRIVES" is widely recognized as the most *comprehensive* and *complete* book of its kind—and also the *easiest to use*. It enables you to find all the possible combinations of stock drives for your machine with the *least amount of calculation*—and almost *automatically* gives you the drive of *lowest price* that will be adequate for the job.

V Saves You Time, Work and MONEY

The GUIDE tells all about "Design Horsepower" and Speed Ratios —and by merely *scanning* a page of GUIDE designs which use the *stock pulleys* that meet your needs, you can quickly determine the center distances that will fit your equipment layout while, at the same time, enabling you to use *standard belts!*

V You Can Design ANY Drive

The Gates GUIDE tells *when* you can use a *V-Flat* drive—and gives you a simple way to choose a practical V-Flat design using *stock* driver sheave with whatever flat pulley you may already have on hand.

As a matter of fact, by using the Gates GUIDE you can design—with a *minimum of calculation—any kind* of V-Belt drive for every kind of operation—including quarter-turn drives and Dubl-V drives.

V Written By GATES Engineers

The GUIDE is compiled and written by Gates Engineers. It embodies their specialized knowledge gained through operating the largest V-Belt testing laboratories in the world! Here, an average of *32,000 hours* of testing *per week* are run on V-Belts alone! No wonder the Gates "GUIDE for SELECTING or DESIGNING V-BELT DRIVES" is regarded by Engineers as the *authority* on V-Belt Drive design.

Also, A Monthly Report of All That's *New* and *Progressive*

The Gates "INDUSTRIAL NEWS," published monthly, gives interesting "case histories" of V-Belt drive installations designed and used by practical operating men and engineers. These case histories are selected from thousands of applications. Among other things they show — what can be accomplished with V-Belts — how to install various drives—unique applications—unique uses — examples of savings — and other valuable "how-to-do" ideas.

Whether you are a practical operating man or a design engineer, you can save much time, hard work and money by having these useful Gates publications. Just ask for them—using the coupon below. They will be sent to you without cost or obligation of any kind!

Eng. 901

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IN ALL INDUSTRIAL CENTERS

THE GATES RUBBER COMPANY
World's Largest Makers of V-Belts
DENVER, U.S.A.

The Gates Rubber Company
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☐ The Gates "GUIDE for SELECTING or DESIGNING V-BELT DRIVES."

☐ Gates "INDUSTRIAL NEWS," published monthly.

Name _____

Position Held _____

Name of Firm _____

City _____ State _____

WALWORTH LUBRICATED PLUG VALVES

offer these advantages

- . . . Direct port opening
- . . Quarter turn opens or closes valve
- . . . Dead tight shut-off
- . . Freedom from attack by fluids being handled
- . . . Pressure sealed
- . . Made in a complete line. Sizes from ½" to 26" for pressures from 175 to 5,000 psi., and for vacuum requirements

THESE are just a few of the reasons why Walworth Lubricated Plug Valves give "top" performance on many *difficult* services.

All Walworth Lubricated Plug Valves employ special insoluble lubricants which protect the plug and body against contact with the line fluid, thus combatting erosion and corrosion.

The lapped surfaces of the valve are "pressure sealed" when the valve is in either the open or closed position. By turning the lubricant screw, lubricant is forced under high pressure through a grooving system that completely encircles the ports as well as the top and bottom of the plug.

The lubricant seals the valve against leakage, and reduces friction between plug and body. This permits easy, quick, full-opening, or tight shut-off with only a quarter turn of the plug.

Number 1700 (illustrated) is a Steel-iron valve, wrench operated, designed for a working pressure of 200 pounds WOG (water, oil, or gas). Valves are available in either screwed or flange types. Screwed type have API line pipe thread lengths. Flanged type (No. 1700F) is faced and drilled to American Standard for 125-pound cast iron flanges unless otherwise specified.

For further information about No. 1700 as well as the complete line of Walworth Lubricated Plug Valves, write for catalog.

WALWORTH

valves and fittings

60 EAST 42nd STREET, NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

You Get Longer Service from Rome 60 MINING CABLES!

Look for Appro. No. P-105 BM Molded in the Neoprene sheath—your assurance of compliance with Federal and Pennsylvania Safety Codes.

NEOPRENE WEBBING provides *extra* protection against shorts

Short cuts don't cut shorts . . . another reason why more mines are switching to Rome 60 Mining Cables. The Neoprene webbing which separates the ground wire from the two insulated conductors on Rome Parallel Duplex is only one example of the *extra protection* Rome builds into its products to minimize your operating costs.

Aided by alert research and engineering, Rome is constantly on the lookout for better materials and better methods. That's why Rome 60 Mining Cables are regarded by mine operators as the best available. Crush resistant, heat resistant, flame resistant, acid resistant, abrasion resistant, non-kinking, and uniform in diameter, they combine *all* the qualities that give you the longest service. Ask for our descriptive folder and compare for yourself.

IT COSTS LESS TO BUY THE BEST...BUY ROME 60

THE ROME 60 LINE INCLUDES:

- Type SO portable cords
- Single conductor locomotive cables
- Concentric mining machine cables
- Twin (parallel duplex) mining machine cables—types W and G
- Multiple conductor portable power cables types W and G

ROME CABLE
Corporation
ROME • NEW YORK
From Bar to Finished Wire

ROME CABLE ROME, N.Y.

PARIS MANUFACTURING COMPANY

Announces

THREE *NEW* DRILLS

The **PARMANCO** Coal Drill will drill 2¼ inch holes at a speed of up to six feet per minute in #5 coal. Equipped with heavy duty truck-type transmission and rear end and a complete hydraulic feed, the drill is operated by one man from the control seat. It is made in two sizes with a 12 h.p. or 25 h.p. gas motor and all units are completely self-contained and enclosed in oil-tight cases.

ALREADY USED by

United Electric Coal Companies 4	Knox Coal Mining Co..... 1
Ayrshire Collieries Corp..... 2	Huntsville Sinclair Mining Co. 4
Big Bend Collieries, Inc..... 1	Truax-Traer Coal Company.... 1
Little Sister Coal Corp..... 1	

THIS UNIT IS DELIVERING 6-INCH SHOT HOLES — READY FOR LOADING at Better Than a Foot a Minute ! ! !

The new **PARMANCO** Hi-Speed Horizontal Drill is completely redesigned around a 40 h.p. engine with four drilling speeds which, in field tests, has cut one-third off the footage drilling time —a cost-per-drilling-foot saving that we are passing on to the strip mine operator and contractor at no increase in our price. In addition the drill is equipped with a starter and generator, dual type front wheels, truck type rear axle with mechanical brakes and a traction drive with both forward and reverse.

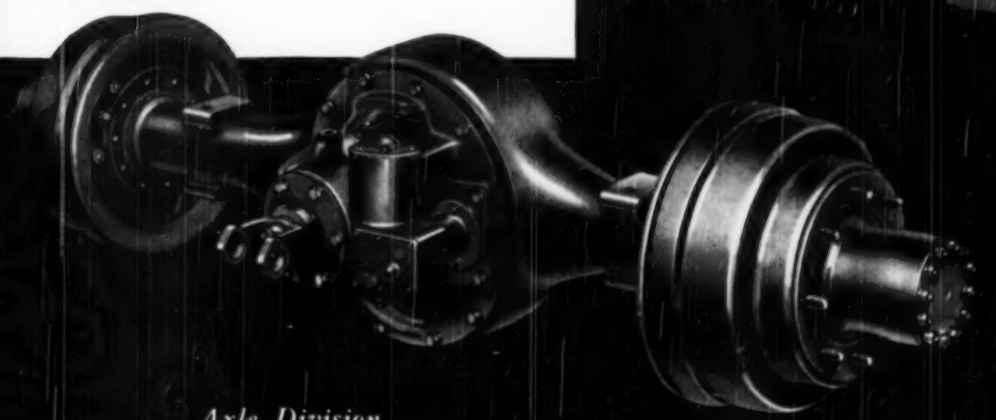
PARIS MANUFACTURING COMPANY
Paris, Illinois

EATON

2-Speed Truck

AXLES cut down Stress and Wear on Vital Truck Parts

Eaton 2-Speed Axles *double* the conventional number of gear ratios, enabling drivers to use the *right* gear ratio for every operating condition—starting out under full load, climbing grades, highballing, quick shifting in traffic. As a result, vital truck parts are not overstressed, engines are permitted to run at most efficient speeds, minimizing engine wear. Furthermore, Eaton Axles last longer, because planetary gearing better distributes gear-tooth loads, reducing stress and wear on the axle itself. Ask your truck dealer to explain how Eaton 2-Speed Axles more than pay for themselves.

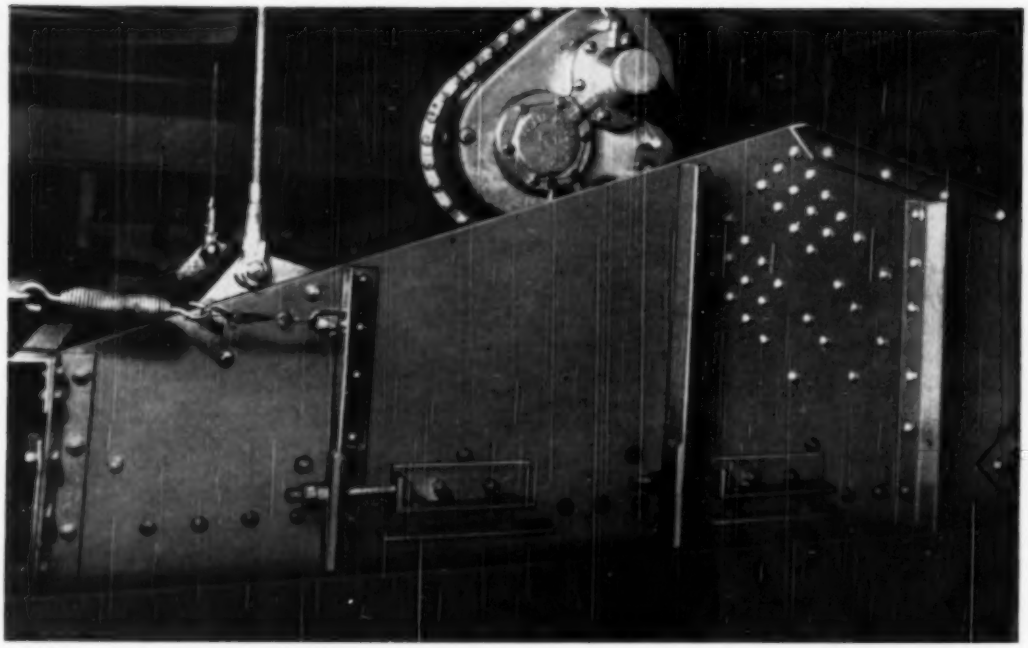


Axle Division

EATON MANUFACTURING COMPANY

CLEVELAND, OHIO

PRODUCTS: SODIUM COOLED, POPPET, AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS • SPRINGTITES SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS



Sludge Recovery Installation Paid for Itself First Month!

THIS LOW-HEAD dewatering screen — and the Allis-Chalmers solids handling pump that goes with it — reclaims 40 percent of the slurry from the settling cone underflow at Pyramid Coal Company's Victory mine, Seelyville, Indiana.

That amounts to 12 tons per hour of 8 x 28-mesh coal recovered. And it's a readily salable product, with average ash content only 9.9 percent and surface moisture 19 percent.

HERE'S HOW IT WORKS

- **Slurry from settling cone (20 to 25 TPH of 8-mesh x 0" coal with 600 gpm of water) is passed over a wedge wire screen which removes 30% of the water.**
- **Then the slurry goes to the 5x14-ft *Low-Head* vibrating screen with end-tension deck shown above.**
- **Allis-Chalmers end-tension deck construction creates a series of dams which turn bed of coal over repeatedly, assuring efficient drainage. Sprays near feed end help in sizing.**

Since it was installed, this screen and pump combination has actually *paid for itself several times over!*

Sludge screening is only one way *Low-Head* vibrating screens are earning dollars for many coal operators. Other ways: Use of *Low-Head* screens with side tension deck for dewatering and sizing large coal . . . for pre-wetting ahead of heavy media units . . . for draining, washing and dewatering following heavy media units. Horizontal operation saves headroom, cuts installation costs.

The Allis-Chalmers representative in your area can show you how *Low-Head* screens may boost your profits. Call him, or write for **Bulletin 25B6280B.**

ALLIS-CHALMERS, 968A SO. 70 ST. MILWAUKEE, WIS.

"TEAM UP" COAL PROCESSING EQUIPMENT WITH A *COMPLETE* ALLIS-CHALMERS DRIVE!

Motors — Controls

Texrope Drives

OTHER COAL EQUIPMENT

Vibrating Screens

Centrifugal Pumps

Hoists

Rectifiers

ALLIS-CHALMERS

Low-Head is an Allis-Chalmers trademark.

A 2905

Thermoid Research Gives Greater Flexibility and Wear-ability to New-Type Hose!

Thermoid has designed *Thermine* Air Hose especially for more efficient and economical use in drilling operations—from construction jobs to mining.

Increased flexibility allows greater freedom of movement and permits bending the hose easily around tight corners. A heavy synthetic rubber oil-proof tube is reinforced with heavy braided rayon cord. Smooth, extra-heavy rubber cover offers maximum resistance to abrasion and cutting by sharp rocks.

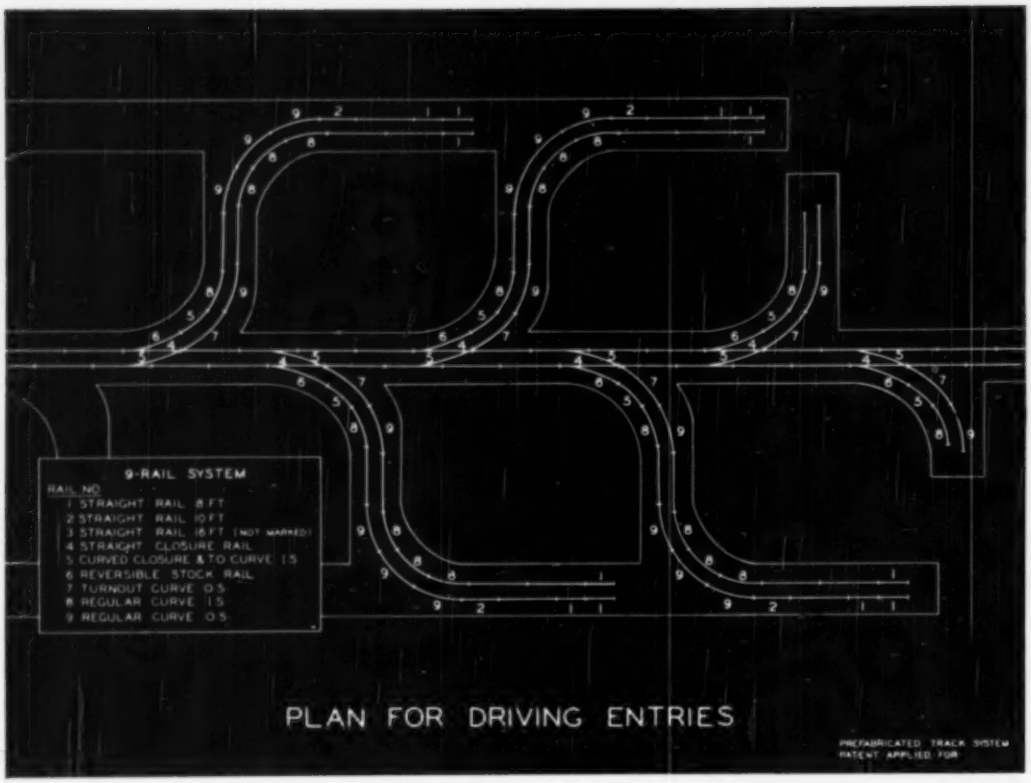
Thermine Air Hose is mandrel-built from ¼" to 1½" inclusive in 50 ft. lengths. Available at your nearest Thermoid Distributor.

Thermoid Quality Products: Transmission Belting • F.H.P. and Multiple V-Belts • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Molded Products • Industrial Brake Linings and Friction Materials.

For *Complete* Satisfaction *Specify* Thermoid!

Thermoid Company

Main Offices and Factory • Trenton, N. J., U. S. A.
Western Offices and Factory • Nephi, Utah, U. S. A.
Industrial Rubber Products • Friction Materials • Oil Field Products


9-RAIL SYSTEM
RAIL NO.
1 STRAIGHT RAIL 8 FT.
2 STRAIGHT RAIL 10 FT.
3 STRAIGHT RAIL 16 FT. (NOT MARKED)
4 STRAIGHT CLOSURE RAIL
5 CURVED CLOSURE & TO CURVE 1.5
6 REVERSIBLE STOCK RAIL
7 TURNOUT CURVE 0.5
8 REGULAR CURVE 1.5
9 REGULAR CURVE 0.5
PLAN FOR DRIVING ENTRIES
PREFABRICATED TRACK SYSTEM
PATENT APPLIED FOR

The Simplest Way is the Best Way

Simplicity has always been the keynote of Bethlehem prefabricated track, and the layout shown above is one good example. In this instance, straight rails are needed in only four lengths, and there are but five different lengths of curved rails.

It's hard to imagine anything much simpler. For quick identification, numbers welded on the rails are keyed to corresponding numbers on the drawing furnished the track crew. To illustrate: where the plan calls for an "8" rail, the trackman simply selects one marked "8" and places it as indicated on the blueprint. Highly-trained crews aren't needed; assembly is so easy that very little instruction is required.

Another great feature of Bethlehem prefabricated track is its flexibility. *It is equally suitable for both advancing and retreating.* It can be applied equally well to both the block system and the room-and-pillar system. It can be adapted to 45-deg, 60-deg, or 90-deg turns. Moreover, Bethlehem track is equipped with reversible stock rails, which can be used for either right- or left-hand turnouts.

Just give us projection plans of your workings or proposed workings; we'll tailor the track layout to fit your needs. It will come to you complete with rails, switches, switch stands, frogs, steel ties, turnouts, joint bars, and all other accessories. For full details, call or write the Bethlehem man nearest you. He's at your service.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor:
Bethlehem Steel Export Corporation

★ BETHLEHEM STEEL ★

BETHLEHEM PREFABRICATED TRACK

These 7 Great Features Add Up To
LONG V-BELT LIFE

1 *Powerful Cord Structure* built up of hard-twisted, high tensile strength cords, impregnated with live rubber compound to prevent chafing and heating.

2 *Thick, Resilient Cushion* of rubber supports cord structure at correct pitch line . . . absorbs shocks . . . helps dissipate heat.

3 *Tough, double-wrapped cover* of long staple fibres, bias cut for elasticity and impregnated with rubber. Protects cords . . . seals out dust, grit, moisture.

4 *Extra Stiffening Plies* of heavy fabric and rubber help keep the belt square in the groove.

5 *Precision Molded And Cured* in accurate steel dies. Gives belt the *straight* sides necessary to provide the bulging gripping action that all V-belts need.

6 *Every Belt Carefully Weighed* and inspected during construction. Assures perfect balance and uniformity.

7 *Accurate Set Matching* . . . Every finished belt measured while running under load. *Texrope* multiple V-belts are matched in sets to assure uniform load on each belt.

COMPLETE V-BELT SERVICE

Get everything you need for your V-belt drives . . . V-belts, standard and variable pitch sheaves and speed changers . . . from one reliable source. 144 page *Texrope* Pre-engineered Drive manual covers 90% of requirements. Get your copy today from your A-C Authorized Dealer or Sales Office or write for Bulletin 20B6956. Also in Sweet's.

ALLIS-CHALMERS, 968A SO. 70 ST. MILWAUKEE, WIS.

Texrope and *Super-7* are Allis-Chalmers trademarks.

Super-7 *Texrope* V-Belts result from the cooperative research of Allis-Chalmers and B. F. Goodrich; and are sold only by A-C dealers and offices. A-2836

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.

MOTORS — ½ to 25,000 hp and up. All types.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

PUMPS — Integral motor and coupled types. Sizes and ratings to 2500 GPM.

ALLIS-CHALMERS

NEW! BAKER engine

for the ALLIS-CHALMERS

mounted Bulldozers and Gradebuilders

HD-5 TRACTOR

They're here — sensational, new Baker Bulldozers and Gradebuilders, ready for your job whatever it may be within the range of the Allis-Chalmers HD-5 tractor. They're engine mounted and they pack a terrific wallop — they're well balanced, extra sturdy, and built for big volume, tough earthmoving.

This new Baker design brings you everything you've always wanted in a bulldozer — the simple, fast acting, most dependable hydraulic control system in the business — finger-tip, precision control of the blade — unimpaired visibility — direct lift with plenty of down-pressure for tough digging — extra operator comfort and convenience, and balance that converts every ounce of tractor power into push on the blade.

Built into the HD-5, these new Bakers provide new standards of performance, economy and all-around utility. Before you buy ANY bulldozer, check over these new Bakers at your Allis-Chalmers dealer or write direct for Bulletin 881. Baker Mfg. Co., Springfield, Illinois.

POWER plus SPEED to load any materials and do it Consistently

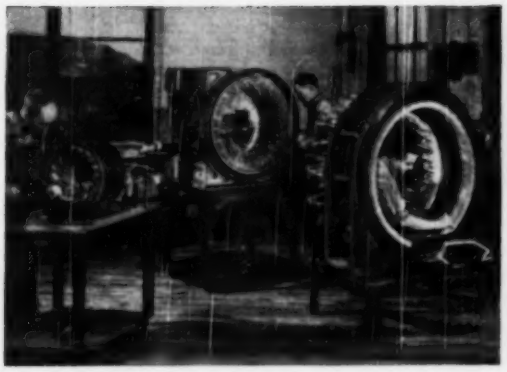
The powerful "Automat" shovel loading head exerts a lifting force on its forward lip of 1,500 to 2,000 pounds, giving it tremendous digging, lifting and pulling ability to dislodge and load extra heavy and "tight" materials.

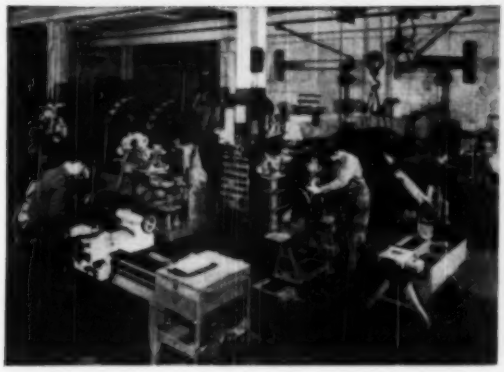
With its 47 inch wide shovel head working at 45 to 50 strokes a minute, you get speed and big capacity for the rugged job of handling any kind of materials you put the "Automat" to loading.

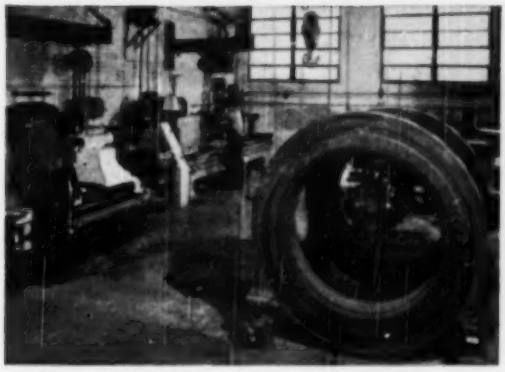
For complete information write Myers-Whaley Co., Knoxville, Tenn.

MYERS-WHALEY

"MECHANICAL LOADERS EXCLUSIVELY FOR OVER 40 YEARS"







For Any Size Motors

DEPEND ON REPAIR SERVICE LIKE THIS!

Example: a Midwest Utility recently burned out a vital 75 hp motor. They called Chicago Electric, their nearby A-C Certified Service Shop, at 11:00 a.m. At 4:00 p.m. the *same day*, Chicago Electric had the unit repaired and back in service! Total time: 5 hours.

WHEREVER YOU ARE, you can get quick, dependable service from your nearby A-C Certified Service Shop, for there are over 75 such shops in all major industrial areas.

These shops have been selected on the basis of, **1)** quality of their work, **2)** facilities, and **3)** their community reputation. They maintain experienced personnel and use factory parts or parts of equal quality. They can be relied on for good work at honest prices.

When you need this kind of repair service on motors, controls or transformers, call your nearest Allis-Chalmers Certified Service Shop.

Need New Motors Or Starters?

For motors from one hp up to the largest sizes — with Allis-Chalmers controls to match — call your nearby A-C Dealer or Sales Office.

A-2949

ALLIS-CHALMERS, 968A SO. 70 ST.
MILWAUKEE, WIS.

ALLIS-CHALMERS

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

TEXROPE — Belts in all sizes and sections, standard and Vari-Pitch sheaves, speed changers.

PUMPS — Integral motor and coupled types from ¾ in. to 72 in. discharge and up.

Shoot

PLAIN

REINFORCED

with PRIMACORD

Would you like to cut your cost per yard? Of course — but how? One sure way is to produce well-broken rock that a shovel can scoop and load, scoop and load . . . good digging!

Good digging results from good shooting, and good shooting results when explosives are detonated with Primacord.

Primacord is a detonating fuse with an explosive core of PENTAERYTHRITETETRANITRATE contained within a waterproofed textile covering. It detonates at a speed of almost 4 miles per second. It is flexible, strong, light in weight and easy to handle. A non-conductor, Primacord is insensitive to stray currents.

You load and detonate with Primacord. It extends from top to bottom of the hole, and detonates each cartridge in the load.

You connect all holes with Primacord in a planned rotation that promotes relief of burden, producing better fragmentation . . . better digging.

* * *

Primacord is available in Plain and Reinforced, wound on spools containing 500 and 1000 ft. Ask your explosives supplier or write direct to The Ensign-Bickford Company, Simsbury, Connecticut.

PRIMACORD-BICKFORD Detonating • Fuse •

Also Ensign-Bickford Safety Fuse Since 1836

P-3

Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

MARCH, 1950

IVAN A. GIVEN, EDITOR

Another Jacksonville?

WHETHER JACKSONVILLE is completely gone from John L. Lewis' memory or whether he felt that the situation was enough different this time to rule out the possibility of failure is a question no one can answer. But there is a striking similarity in the conditions then and now—and some striking differences.

Then, as in 1949 and 1950, the competitive situation demanded, above all, reason in recognizing economic facts and positive action toward assuring conditions that would enable the industry to meet and beat competition. But Lewis imposed the Jacksonville agreement on the bituminous industry. In so doing, he won the battle but lost the war. By 1930, the United Mine Workers of America was through as an effective force, the miners had lost immeasurable ground and the industry had taken a lot of hard knocks at a time when peace and a chance to achieve a competitive cost were all-important. With an even-tougher competitive situation ahead in 1949, it is difficult to see logic in a repetition of the Jacksonville tactics. Lewis very recently has been painted as a leader who foresaw trouble ahead and had the remedy to protect not only his membership but also the coal operators. The fact is that the difficulties now facing the industry—and which Mr. Lewis used as his excuse—are a direct result of his own actions in forcing up cost and creating additional consumer dissatisfaction through making it impossible to depend upon coal for an uninterrupted supply of fuel. Recalling Jacksonville and noting the parallels of today, the answer seems to be that a desire to rule or ruin and not wisdom was the motivating force.

Where the present differs from the past is in the fact that Lewis now operates under a Congressional grant of monopoly power backed up by administration favoritism. Before Lewis kicked over the apple cart again Feb. 4, Truman and his cabinet had intimated that they were quite ready to overlook the fact that he was trying to cut the coal industry down to his ideas of size and therefore would go along with him on his three-day production limit. This marked a new low in administration willingness to swallow adverse consequences for industry and the Nation in return for labor-leader support. The record in Congress is little better. In spite of wide dissatisfaction with abuse of monopoly power, the best so far is a Senate bill aimed at curbing union monopoly power only when "unreasonable." This is like saying that murder is all right unless it is "unreasonable."

Thus, the operators have been left as the only group with the will to attempt bringing about a change. And the change is needed, even though the cost is and will be heavy. But it would have been heavier still had nothing been done to check Lewis, who stands as the arch-apostle of the arbitrary and unlimited use of monopoly power. To supplement their other efforts, the bituminous operators, on Feb. 2, approved an intensified public-relations campaign on monopoly and its meaning. It includes a broadening of efforts to bring the facts home to the miner—a step in the right direction. If the miner can be made aware of the real situation, the change for the better will be much easier.

Whether the future will prove to be another post-Jacksonville era is impossible to say. But if it isn't, it won't be because Lewis didn't try to make it one. He gave competition the best break it has had in years. If the industry can win back its losses—as it should be able to if union monopoly power can be curbed—another such era can be eliminated. For this, both the miners and the public can thank the operators.

Fair Deal Plans, With Bigger Spending Ahead, Draw Attention to . . .

Here's Truman's Budget

	(Billions)
Total budget	$42.1
Social welfare, health, security	2.7
Housing	1.3
Education	0.4
Agriculture	2.2
Natural resources	2.2
Transport and communications	1.7
Labor	0.2
Finance, commerce and industry	0.2
General government	1.3
Total, domestic and civilian	12.2
Veterans	6.1
Foreign	4.7
Defense	13.5
Interest on debt	5.6

Byrd Asks This . . . To Get This

	(Billions)
	$36.0
No new laws or taxes	1.9
Tighten RFC operations	1.0
No new aids	0.1
	2.2
No non-essential public works	1.2
Higher postage, better efficiency	1.2
	0.2
Cut administrative costs	0.1
Cut administrative costs	1.0
Cut civilian workers by 250,000	8.9
Cut administrative costs	5.3
	4.8
Cut civilian workers by 250,000; adopt Hoover recommendations	11.3
	5.7

Here's the President's Tax Plan:

1. Lower depletion rates for oil and mining companies.
2. Extension of the loss carry-forward period to five years; no mention of changing carry-back period.
3. Lower corporation taxes in the $25,000-to-$50,000 notch.
4. Higher corporation taxes in the over-$50,000 notch.
5. Lower taxes on freight, passenger travel and communications.

Here's Its Effect on Coal:

1. Coal's depletion rates, already low, probably will not be cut further.
2. A better break, but still not good enough, in averaging years of profits with years of losses.
3. Some help, but not much, to small coal companies.
4. Killing the incentive to grow and prosper and make a fair profit.
5. A slight lowering of the high cost of doing business.

Here's What Coal and Other Industries Really Need:

A federal tax policy that will:

1. Take as little as possible.
2. Divide the tax load equitably.
3. Offer incentives to grow.
4. Consider special needs of various industries.

An administration that will:

1. Give full value for taxes paid.
2. Restrain the spend-and-elect urge.
3. Stop waste.
4. Follow a consistent policy toward business.

COAL AND TAXES

HOW TAXES BOG DOWN . . .

- Young Men Who Want to Get Ahead
- Small Companies That Want to Grow
- Big Companies That Want to Stay Strong

WHAT YOU CAN DO TO . . .

- Reduce High Taxes
- Cut Government Waste
- Help Yourself and Your Company

IF YOU WANT TO SAVE a little money out of your salary to start a coal mine of your own or protect yourself against sickness or old age, high taxes have got to come down.

If you already have your own small coal mine and want your business to grow, or if your company is big now and you want it to prosper and stay in business, high taxes and unfair taxes probably are your biggest stumbling blocks.

That's something to write to your Congressman about.

How High Are Your Personal Taxes?

Figuring a $212,000,000,000 national income and President Truman's estimate of some $38,000,000,000 to be paid in federal taxes of one kind and another, the federal government in 1950-51 will take about $1 out of every $5.60 of national income—the total of what all the people earn. That doesn't count state and local taxes, which will run the total up much higher. It's a big bite any way you figure it.

For you, the company you own or the company you work for, it adds up to this: While the hazards of getting ahead have stayed the same or grown even worse, taxes and government policies have whittled down the rewards of thrift, hard work and risk-taking and narrowed down a man's right to make his own future.

Suppose, for instance, you're a foreman in a coal mine. You'd like to put aside some of your pay to start your own coal business or take care of yourself when you get too old to work. Twenty years ago, in 1929, it wasn't hard to do. Say your salary in those days was about $5,200. You could have lived pretty well on $4,000. That would have left you $1,200 for your savings. If you had invested that much each year, you could have retired 25 years later with an income of $3,000 a year—if the value of the dollar had held steady in the meantime.

But the value of a dollar shrank a lot in the 20 years between 1929 and now. If you want the standard of living now that $4,000 would have provided in 1929 and if you'd like to have a retirement income equal to $3,000 in 1929 dollars, your salary now would have to be close to $13,500 in 1950 dollars and you'd have to save and invest enough of it to pay you dividends of $7,500 a year in 1950 dollars.

Why did the dollar shrink? Here are the figures:

Why It's Hard to Save Money

	1929	1949
Federal income tax—married man, 2 dependents, $5,000 income	$3	$544
Cost-of-living index (1935-39 = 100)	122.5	168.5*
Interest on high-grade corporate bonds	5%	2½%

*October

The income tax shown above, of course, isn't the only tax that hits you hard. Federal taxes increase your telephone bill 15 to 25% and your electric bill 3½%. If you take a plane, train or bus trip, the government tacks 15% on to the cost of your ticket. If you travel by car, you pay federal taxes of 1½c per gal on gasoline and 6c on lubricating oil, not to mention state gasoline taxes. Your car itself, if it's a popular-priced model, cost about $450 more because of federal, state and local taxes. Taxes on a pack of cigarettes total about half of what you pay. In all, taxes of all sorts take about one-fourth of our national income.

Do Business Taxes Hurt?

In 1929, corporations paid $1 to the federal government out of every $7.94 they made. By 1949, they were paying $1 out of every $2.50. Add in state and local corporation taxes and federal and state taxes for social security, workmen's compensation, unemployment and other purposes, plus the added costs of paper work and bookkeeping that employers have to do for Uncle Sam and the states, and you wonder how any business makes enough money to keep going.

With a little tax relief, business could buy the new machines and build the modern plants it needs to make more goods at lower cost and sell them at prices within the reach of more customers. But with taxes as high as they are, business doesn't have much left over after paying off the tax collector. Likewise, since taxes cut down the size of dividends a company pays to its stockholders and also take a big cut out of dividends after they are paid to stockholders, people just aren't much interested in saving their money to invest in business.

On the horizon, there may be a little tax relief for small coal companies, as well as other small businesses. In his tax message to Congress Jan. 23, President Truman asked for a cut in taxes on business profits in the notch between $25,000 and $50,000. The rate in that notch now is 53%. But bigger businesses will take the rap. Seeking an extra billion in taxes, the President asked Congress to raise taxes on corporations making over $50,000. The present rate is 38%.

What Made Your Taxes Go Up?

The last war has a lot to do with high taxes, of course, but that's not the whole story. The government now is doing lots of things it didn't do in, say, 1929, and it is spending more for all the things it does. Table II gives just a few of the facts.

Meanwhile, the cost of government per person has mounted up and up. In 1928-29, when our population was 122,600,000, the government took in $33.13 per person and spent $31.60. In 1950-51, Uncle Sam

High Taxes Grow From Government Waste and High-Cost Welfare

Table I—Coal Profits Took a Licking in 1949

		Net Earnings 1948	Net Earnings 1949	Percent Decline	Earnings per Share 1948	Earnings per Share 1949
Third Quarter	Colorado Fuel & Iron Co.	$2,245,660	$1,414,832	41.7	$2.04	$1.13
	Pittsburgh Consolidation Coal Co.	6,527,949	2,053,511	68.5	3.02	0.95
	United Electric Coal Cos.	1,063,915	—57,593	105.2	...	...
	West Kentucky Coal Co.	1,092,599	696,611	36.2	1.27	0.81
	West Virginia Coal & Coke Co.	1,044,793	—38,024	103.6	...	...
Mid. 6 Mos.	Peabody Coal Co.	1,516,027	—331,092	121.8	...	...
	Truax-Traer Coal Co.	2,282,588	111,403	95.1	2.32	0.11
First 9 Months	Clinchfield Coal Corp.	3,444,289	1,119,858	67.4	4.59	1.49
	Island Creek Coal Co.	4,699,050	3,503,198	21.2	3.83	2.85
	Lehigh Valley Coal Corp.	1,263,271	—697,496	155.2	...	...
	Pond Creek Pocahontas Coal Co.	2,595,575	1,865,981	28.1	7.65	5.50

Table II—Federal Budget Zoomed Up, 1929-50

	1929 (Millions)	1950 (Millions)
Total budget	$3,848	$43,297
Defense	678	13,148
Veterans	419	6,905
State Department, including foreign aid	13	5,946
Housing	...	1,006
Agriculture	172	2,206
Atomic Energy Commission	...	673
Tennessee Valley Authority	...	52
Department of Labor	11	219
Interest on public debt	679	5,725

will take in about $255 per person and will spend $293. Spending more than comes in will run the government about $5,500,000,000 in the red. Added to deficits piled up in years past, the total public debt in 1951 will be about $263,000,000,000, or $1,771 for every man, woman and child in the country.

The more money the government takes in, the more people it must hire to run bureaus and spend money. In 1929, for instance, there were about 588,000 civilians at work for the federal government. That was one out of every 209 people in the country and one out of every 70 who had jobs. In 1949, with 2,050,000 federal civil-service workers, the proportion was one out of every 70 of the whole population and one out of every 30 gainfully employed. If you add in the men and women in the armed forces, plus those working for state and local government, including teachers, you come up with one out of every 19 people employed drawing his salary out of taxes you and others paid in 1949.

Does Government Waste Cost You Much?

The truth is, lots of people are on the federal payroll because our government is badly organized and its methods are old-fashioned. Dr. Robert L. Johnson, president, Temple University, and chairman, Citizens' Committee for the Hoover Report, points out that the government owns $29,000,000,000 worth of goods, including 1,000,000 automobiles, and has no clear idea where they are or what they are.

"Uncle Sam borrows money from himself and pays interest on it," Dr. Johnson continues. "He maintains enough records and documents—mostly worthless—to fill six Pentagon buildings. He keeps seven different sets of books. Neither his books nor his budget gives any real notion for the financial score. The postoffice, for example, has to wait eight months to find out exactly how much money it has lost. This year it will lose about $500,000,000. This is more than the whole cost of government 50 years ago."

Dr. Johnson and the Hoover Commission saw a lot of money wasted in other ways by our government. Take the Veterans' Administration, to mention only one field. The VA has built lots of hospitals and wants to build more. The cost of a VA hospital runs from $20,000 to $51,000 per bed against $16,500 for each bed in a voluntary community hospital. The VA takes an average of 73 days to send a death claim through the mill. Private life insurance companies average only 15 days. Private insurance companies also pay their own costs of administration and their own overhead. The VA has no operating costs—they are paid by appropriations from Congress out of taxpayers' money.

Those are only a few of the reasons why government costs a lot and taxes are high. If you want more reasons, write to the Superintendent of Documents, Government Printing Office, Washington 25, D. C., enclose 60c with your letter and ask him to send you a copy of "The Concluding Report of the Hoover Commission on Reorganizing the Executive Branch of the Government." The booklet makes pretty good reading.

What Will Welfare Plans Cost You?

The New Deal and the Fair Deal believe the government can take care of your future better than you can. That's why we've got federal old-age pensions and unemployment payments and it's why the Fair Deal is trying to push through a plan for compulsory health insurance. You pay your money in through payroll deductions, the government takes it over and pays somebody to handle it for you and you finally get it back—or part of it—when and if the government thinks you need it.

To keep this social-security program going, the law makes employers and workers pay equal shares through payroll deductions. In 1942 workers and employers together paid in $895,336,000. In 1949, how-

ever, at a rate of 1% each on workers and employers, the government took in $1,690,000,000. On Jan. 1, 1950, the rate was raised to 1½%, which probably will push the take up to $2,245,000,000 in 1950. This, together with upping the base pay from $3,000 to $3,600 per year for figuring taxes, as proposed, would boost the total to $3,715,000,000 in 1951. Besides, the President has asked Congress to raise the rate to 2% on Jan. 1, 1951, and to raise the base pay to $4,800.

A big part of the Fair Deal's social-security program already has been passed by the House of Representatives in H. R. 6,000. The Senate will begin discussing it soon, if hearings haven't started already. If passed by the Senate, the bill will do the following:

1. Add 11,000,000 new persons to the 35,000,000 now covered, thus including a lot of self-employed people, domestic servants, food processors, salesmen, contract loggers, mine lessees and others.

2. Raise payments to old people, widows and children by 70%, with minimum payments raised from $10, as at present, to $25 per month and maximum payments upped from $85 to $150.

3. Make it possible for you to earn $50 a month and still draw government money after you retire. Under the present law, if you earn $15 or more per month, you can't draw government benefits.

4. Give wage credits of $160 per month to World War II veterans. That means the government would pay their social-security taxes for the time veterans were in service.

5. Increase federal payments to help states care for the aged needy, blind people and dependent children, and broaden child-welfare and medical services.

6. Raise the base on which social-security taxes are figured from $3,000 to $3,600.

7. Set up the following rates for payroll taxes, with self-employed people paying three-fourths of the rates below and employers and employees sharing alike as indicated:

1951-59	2%
1960-64	2½%
1965-69	3%
1970 on	3½%

On top of all this, the Fair Deal is asking Congress to set up a federal health and medical-care program that would take another ¼% of payrolls from employers and workers to start with and would gradually increase to 1½%. This program would cover about 117,000,000 people, including farmers and self-employed workers. Taxes would total about $4,500,000,000 each year and the government would throw in another $1,500,000,000 from general revenues.

According to A. J. Altmayer, chairman, Social Security Board, the whole Fair Deal-New Deal welfare program, now costing about $4.50 out of every $100 of payroll, will cost about $8.40 out of every $100 when and if it gets into full swing. If you and your company divide the cost evenly, that means that $4.20 will be taken out of every $100 of your pay check and that your employer will have to pay $4.20 for every $100 he pays the men and women who work for him. In other words, that's $4.20 per month the government says it will save for you instead of letting you save it yourself, and it's $4.20 times the number of workers that the government won't let your company invest in better machines, new lands, improved equipment and higher wages.

As far as coal is concerned, there's another bothersome thing about payroll taxes. Here's why. In most industries, labor cost in each $1 of product ranges from 25c to 45c. But in coal, labor cost is over 60c in each $1 of product. That means that in most other industries, a payroll tax hits only 25c to 45c out of every $1 worth of product. But in coal, a payroll tax hits 60c out of every $1 worth of coal produced.

Table III—Lean Years and Taxes Hurt Bituminous

	Gross Income, Including Depletion and Depreciation	Federal Taxes Paid	Profit After Taxes
	(Millions)		
1931	$267	$1	$—43
1932	100	1	—49
1933	77	1	—44
1934	230	3	— 5
1935	274	3	— 1
1936	92	3	— 6
1937	103	3	— 4
1938	84	2	—29
1939	83	3	— 8
1940	70	6	9
1941	144	19	25
1942	267	33	36
1943	187	49	47
1944	132	49	35
1945	190	36	37
1946	152	30	50

It's estimated that the bituminous industry alone in 1948 paid about $15,000,000 in payroll taxes, in addition to regular corporation income taxes and other levies. If that sum, instead of going to the government, had been divided up among coal miners, each miner would have got close to $40 more. Being a free man, he could have saved it or spent it, whichever he pleased.

All in all, then, taxes of all kinds, plus top-heavy government and lots of waste, hit you hard if you work for somebody else.

Does Coal Get a Fair Tax Break?

If you have your own coal mine and run your business for yourself, the cards are stacked against you even worse.

For one thing, your big competitors, oil and natural gas, get a better tax break than you do. Here's how it works:

Coal, oil and natural gas are all "wasting" industries. That is, when they are mined or pumped out of the earth, that's all there is. You can't plant some seeds and grow a new crop, like a farmer. If you want to stay in business, you have to move on somewhere else and open another mine or drill another well. Using up the coal, oil or gas is called depletion.

To help "wasting" industries stay in business and buy new property when the old land is worked out, the tax laws let them subtract a depletion allowance from their income each year before they figure their taxes. The money that a company claims for depletion is not taxed. The company puts it away into a special fund to buy or lease new land.

This depletion allowance is a good thing for coal, as well as for coal's competitors. But it would be better if it really filled coal's needs and if it treated coal and coal's competitors alike.

The depletion allowance fails to meet coal's needs in this way: Back before the war, you could open a new mine, including land and equipment, for about $4 to $5 per ton of annual capacity. The cost now runs $8 to $10. That is, where it used to cost not over $500,000 to start up a mine producing 100,000 tons a year, it now costs close to $1,000,000. The amount of money the government lets you deduct for depletion—5% of your gross in-

come—just isn't enough to take care of these increased costs. So, if you work out an old mine and want to start up a new one, you probably will have to break into the profits you made on the old mine or get out and borrow money from your friends. The reason is, the government hasn't let you put aside enough money to keep going. That, in fact, is why some coal companies went out of business in the last year or so.

What About Taxes on Other Fuels?

While coal is allowed only 5% of gross income for depletion, oil and natural gas are allowed 27½% of all the money they take in. That's 5½ times as much as coal is allowed.

Take it this way. In the five years 1942-46, companies that reported net income, or profits, to the federal government showed the following record:

	Bituminous	Anthracite	Oil and Natural Gas
	(Millions)		
Net income before depletion	$631	$111	$840
Depletion allowance	184	39	376
Income tax paid	197	27	169

Thus, in the five-year period 1942-46, bituminous paid 31.2% of its profits in federal income taxes; anthracite, 24.3%; oil and natural gas, 20.1%.

There's another way in which coal gets an unfair break in depletion allowances. The depletion allowance for coal, as pointed out, is 5% of gross receipts. But that's not the whole law. The amount you finally can claim as depletion is limited also to 50% of your net income. Suppose you sell $100,000 worth of coal in a year. Five percent of your gross income, then, is $5,000—your depletion allowance. But suppose, after paying the men who work for you and paying for explosives, power and other operating costs, you make a net profit of only $4,000. Under the 50%-of-net-income rule, you really can deduct only $2,000 for depletion.

In other words, if you have a slow year or a bad year, you can't get the full benefit of your $5,000 allowance. Instead, you're taxed on $3,000 that you ought to be allowed to set aside, tax free, to get a new mine started when your old mine works out. With gross sales of $100,000 you'd have to make a profit of 10%—$10,000—to get full benefit of depletion allowances. History shows that the coal companies that make a steady profit of 10% a year are few and far between.

Oil and gas companies, on the other hand, have a pretty good net-income record year after year. The result is that they can count on more favorable depletion allowances. That gives them a break in taxes and helps them stay in business.

There's some chance, however, that the depletion-allowance advantage of oil and gas may not last much longer. President Truman has asked Congress to lower the allowable depletion rate for oil and mining companies. Since coal's rate already is low, it's hard to believe that he was talking about coal. He probably was aiming at the 15% allowed metal and non-metallic mines and the 27½% allowed oil and gas companies. Though coal would prefer that its own rate be lifted, a decrease for oil and gas would help coal competition-wise.

Are the Tax Laws Clear?

The Bureau of Internal Revenue hasn't helped coal much in interpreting the tax laws. For example, the law makes no clear difference between (1) exploration and development costs which really are production costs and (2) costs of new properties, which depletion allowances are supposed to take care of.

There's a strong feeling among coal men, and it was the real intent of Congress, that whatever it costs above receipts to explore and develop a mine should be deducted 100% as operating costs either within the year or over a period of production. But the Bureau of Internal Revenue wants exploration and development costs over and above receipts to be returned only as depletion at 5% per year. Thus the Bureau interpretation, already upheld in court, keeps an operator from making a quick recovery of a big part of his actual costs.

Suppose You Have a Bad Year?

The tax law now requires a coal company to reduce the book value of its capital assets—land and coal plus machines and equipment—by the amount allowable for depletion and depreciation. That's fair enough if you have a good year. But if you lose money one year and still have to reduce the book value of your assets by the full amount of depletion and depreciation allowable, when the next year comes around the base on which you figure depletion and depreciation is lower than it was and you don't get the credit you're entitled to.

Take it this way: One year, your mine, which you figure is worth $200,000, loses $25,000. In that same year, your allowable depreciation and depletion come to, say, $20,000—10% of your capital assets. Deducting that $20,000 or any allowable part of it from your gross income, as the law directs, won't give you any tax advantage because, in a loss year, you don't have to pay income taxes anyhow.

But you wind up the year with your capital-assets base cut down from $200,000 to $180,000. That's what you'll have to figure your depletion and depreciation on next year. Next year, when your mine may show a modest profit, you'll get a tax credit on only $18,000 instead of $20,000.

Keep this up for 10 years and you will have used up your capital-assets base. For at least one of those years—the year when you lost $25,000—you received no tax benefit whatever through depletion and depreciation. At the end of the 10-year period, therefore, you will have recovered only $180,000 of your original $200,000 investment.

The result is that the real purpose of the law—to help you replace used-up capital assets—is not fulfilled. Instead, your capital, which is one basis for figuring credits against taxes, is reduced and your taxes therefore are higher than they should be.

Can You Keep Your Mine Modern?

You also have to worry about replacing machines and equipment that wear out. The tax laws permit you to deduct a certain percentage of your income and set it aside to buy new machines and equipment. But the amount of depreciation you may deduct is hardly ever enough. The trouble is, as pointed out earlier, that a dollar won't buy as much now as it did a few years back. In other words, you're losing money two ways—by equipment and plant that are wearing out and by dollars that are losing their value.

If you want to keep your mine modern and efficient, you need a better break in figuring depreciation. For example, you—not the tax collector—ought to be the judge of how fast your machines and plant should be depreciated. However fast you depreciate your property, the government really doesn't lose anything in the long run because you can't depreciate it beyond its value anyhow. Besides, it wouldn't be to your best interests to write it off too fast because if you do, you'll soon run out of tax deductions. But if you want to write it off in five years, that ought to be your privilege. Under present laws, it isn't your privilege.

If your business is incorporated —that is, if ownership is divided up among stockholders—Sec. 102 of the Federal Revenue Code requires your company to pay out a reasonable share of its earnings as dividends or else pay a penalty tax on the amount held back. That is, if your company keeps more of its earnings for reinvestment in plant and property than the tax collector thinks reasonable, you'll have to prove to him that you are not acting unlawfully. This part of the tax law takes part of the control of the company away from officers and directors, who ought to know most about the future needs of the company, and gives it to the tax collector. If there's any question about the amount of money set aside, the burden of proof ought to be on the tax collector, not on the company.

Nobody knows better than a coal man that coal mining is an up-and-down business, with long periods of loss and some periods of fairly good profits. Table I indicates how, just within a year's time, coal-mining profits can be whittled down or even turned into deficits. The long-term picture is even more revealing, as Table III shows. Yet the present tax laws permit you to average out your losses and profits for only two years backward or forward when you figure your income taxes for Uncle Sam.

Coal men, looking at the record, believe two years is not long enough. A bill now being considered by the House of Representatives would stretch the carry-forward period to five years and President Truman's tax message in January recommended the same. That would be helpful. But the same bill would cut the carry-back period to one year. That would not meet coal's needs. The two-year carry-back privilege ought to be continued.

Is Anybody Doing Anything to Help Coal?

Along these lines, the Taxation Committee, National Bituminous Coal Advisory Council, recently made a careful study of coal's tax problems and needs. The study was made following the request of James Boyd, director, U. S. Bureau of Mines. Not long ago, on Dec. 14, 1949, the council adopted the final report of the Taxation Committee and shortly afterwards sent it on to Dr. Boyd and Secretary of the Interior Chapman, urging them to think about it carefully. The committee recommended the following:

1. Fix depletion allowances at 15% of gross income instead of the present 5% and raise the allowable deduction to 75% of net income instead of the present 50%.

2. Allow costs of exploration and development over and above net income to be deducted as expenses or operating costs either (1) in the current year, or (2) as deferred costs pro-rated to long-term production, or (3) as a loss in the year when production stops.

3. Allow depreciation and depletion allowance bases to remain the same from one year to the next if the allowable deduction can't be used to reduce income taxes.

4. Revamp the Federal Revenue Code to force the tax collector—not the business man—to prove that an unreasonable share of profits is being held back for future needs.

5. Permit net operating losses to be carried back two years and forward five years.

6. Permit faster depreciation, on a five-year basis if needed, on all machines, plants and equipment installed after the fiscal year ending in 1949.

7. Do away with the tax on dividends paid to one company by another and the 2% tax on consolidated tax returns.

These are sound recommendations. If written into the tax laws, they could help coal toward stability and give it a boost competitionwise. If you want to see them made law, write to your senator and your representative. Back up what you tell them with facts from your own company's records. The National Coal Association will carry on as much of the fight as it can. But it needs the help of every coal man who wants to brighten the future of his company and his industry.

Is Anybody Attacking Government Waste?

There's some big game in the jungle of government waste if you're hunting for lower taxes. If you believe waste can and should be cut, you've got lots of allies. Some of them, in fact, have studied our government thoroughly and can put the finger on specific places where waste can be cut. Among these men are the members of the Hoover Commission, whose report was referred to earlier. They have suggested ways to save $3,000,000,000 to $4,000,000,000 a year.

The Committee for Economic Development, an independent group of business men, recently drew up an alternate budget to President Truman's, showing how costs could be cut and the deficit reduced. Others who have found ways to economize are Senator Byrd (Virginia) and Senator Douglas (Illinois). Senator Byrd, for instance, putting his proposed budget alongside the President's, shows how the cost of government can be cut 'way down.

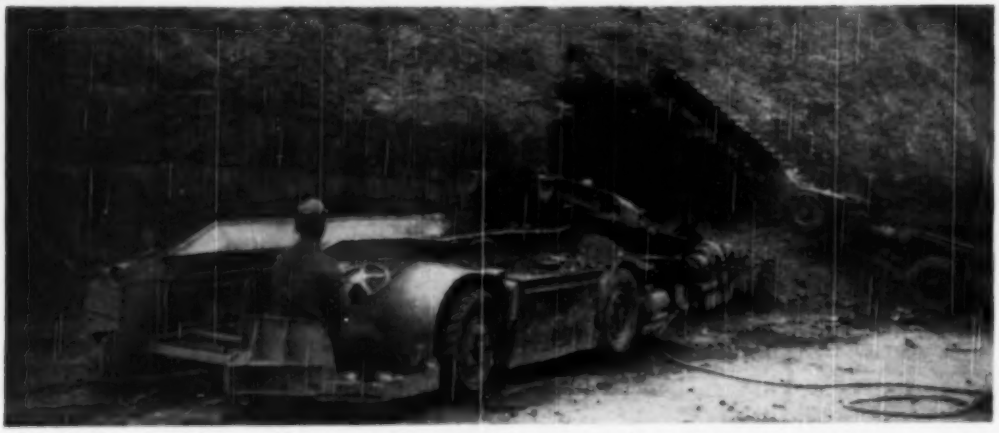
These men make a lot of sense but they need a lot of help.

Can You Do Anything to Help?

Maybe you think your opinion doesn't swing much weight and one vote doesn't count much. But the fact is, Thomas Jefferson, John Quincy Adams and Rutherford B. Hayes were elected President by one vote in the electoral college. A single vote brought California, Oregon, Idaho, Texas and Washington into the union. The draft act just before we got into World War II was carried by one vote in the House of Representatives. And one more Republican vote in each of Ohio's 8,800 precincts would have carried the state for Dewey in 1948. That's how important one vote is.

It all comes down to this:

If you want a chance to get ahead, if you want your company to grow and prosper, if you want government waste stopped and government costs cut, if you want lower and fairer taxes, make your opinion known where it counts most—at the polls and among the men who represent you in Congress. Write and tell them what you think and, when the time comes, vote for the candidates who'll vote your way.



INAUGURATED IN OPENING FAIRVIEW NO. 2 SECTION, MINE 204, experimental loading without shooting at this operation, with a crew of six men, including two on a timbering machine, produced up to 200 tons per shift in a 60-in seam.

Experimental Loading Without

Loading Preceded Only by Cutting and Shearing on an Experimental Basis in Three Consol of Ky. Mines Has Resulted in High Tons per Man and Good Size Yield Under Varying Seam Heights and Natural Conditions

By JOHN K. BERRY
Production Engineer, Consolidation Coal Co. (Ky.)
Division of Pittsburgh Consolidation Coal Co., Jenkins, Ky.

VARIOUS mining men have toyed with the idea of using conventional equipment to cut coal so that it could be mechanically loaded without drilling and shooting. It is known that a number of mining men have conducted brief experiments along that line over the past 15 or 20 yr, particularly since the advent of the universal cutting-and-shearing machine. However, it was realized that even if coal could be mechanically loaded without

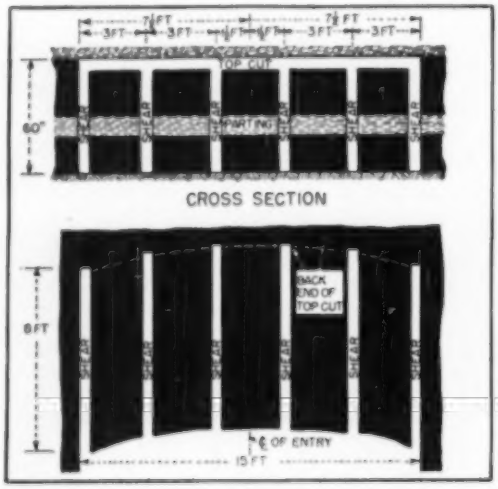


FIG. 1—CUTTING PLAN AT MINE 204. Shears were made across the face, followed by a top cut.

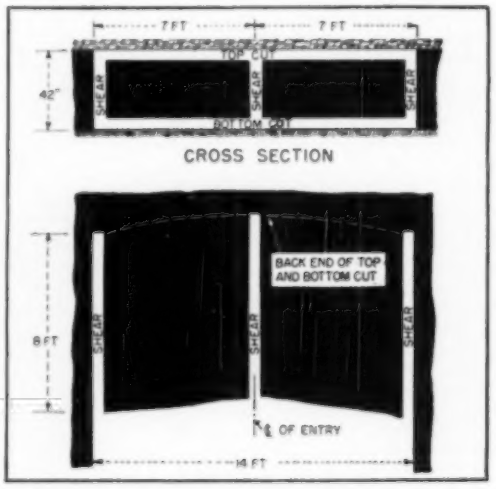
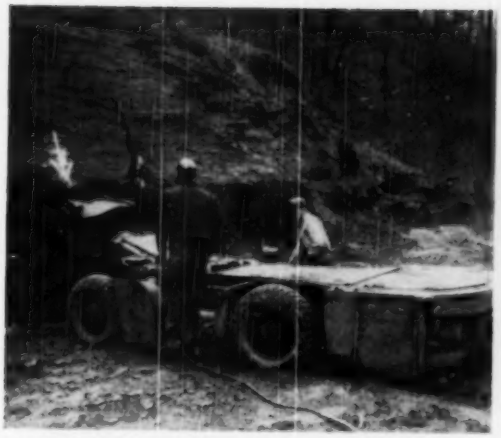


FIG. 2—CUTTING PLAN AT HENDRIX MINE. Bottom cut was made first, followed by shearing and top cutting.



LOW-SEAM LOADING WITHOUT DRILLING AND SHOOTING at Hendrix mine. Coal thickness was 40 to 42 in. Operation started with the first cut and was carried on during the first several months Hendrix mine was in production.

Drilling and Shooting

drilling and shooting, in a practical way, that it still was only a stopgap pending the development of a true and practical continuous mining machine.

The recent success of two new types of continuous mining machines promoted further thinking along that line, and it is known that a number of companies have experimented further on methods of loading without drilling and shooting, utilizing equipment on hand.

First Tests Successful

In Mines 204, 214 and Hendrix, Consolidation Coal Co. (Ky.), a division of the Pittsburgh Consolidation Coal Co., extensive experiments were conducted along this line, utilizing crawler-mounted loading machines and rubber-tire-mounted cutting-and-shearing machines. The experiment started in a new section being driven from the outcrop at Mine 204. Coal in this area has a slick streak between the seam and the fireclay bottom. This, plus the fact that the work was on the outcrop, was originally believed to be partly, if not mostly, the cause of the good results obtained. It was decided, however, to continue with this method in driving that set of entries until and unless a change of conditions forced a stop.

A face crew of six men was used: one man on the 14 BU Joy loader (and later a Goodman 660), one man on a cable-reel shuttle car, two men on the 11 RU Sullivan cutter and two men on a Baker timbering machine setting crossbars on 5-ft centers. With this crew an average of 200 to 225 tons per machine shift was obtained from 14-ft-wide entries in a coal seam averaging 60 in high, with a middle parting varying from 4 to 15 in. The slate roof was bad and the bottom was soft. After several cutting experiments, the pattern was standardized to that shown in Fig. 1.

After advancing the set of entries to a depth of 500 ft, the results in the section were still good, but the system was discontinued because of the inability of the preparation plant to properly handle the quantity of small slate resulting from the multiple shears through the center parting. Rate of actual loading was about 70% that of well-shot coal, as determined by time-studies.

Fine Sizes Unaffected

Two screen tests on the effect of this method on fine sizes were very encouraging. The two tests varied somewhat, but the average showed no appreciable difference in the minus 3/16-in coal, which is the critical size. The plus 4-in size, however, showed an increase of 33 to 100% in the unshot coal over the shot.

The maintenance foreman reported no noticeable increase in breakdowns or maintenance on this section over that for the conventional ones. The section results were good, with 30 to 40 tons per man to the conveyor belt being obtained.

All Entries Mined at Hendrix

The next experiment was at the newly opened Hendrix mine. Here the same Elkhorn No. 3 seam was being mined, but the height was only 40 to 42 in. There was no parting, the coal was burned to both top and bottom, the top was good enough to require no crossbars, and the coal was much more blocky and harder than at Mine 204. From the very beginning, all sets of entries from the outcrop at this mine were successfully driven without drilling and shooting. It was immediately apparent that a bottom cut would be necessary. After several plans were tried, the final one adopted was as shown in Fig. 2.

Because of the longer cutting time required, two shifts of loading were used with three shifts of cutting to balance the cycle. The face crew consisted of five men: one man on a 14 BU Joy loading machine, one on a cable-reel shuttle car, three men (including half the off-shift cutting) on a Sullivan 11 RU machine. With this setup, 190 to 200 tons per loader-shift was obtained. It will be noted that there were no timbermen, as the roof was very

good. This system also gave 35 to 40 tons per man-shift.

At this mine the rate of actual loading, with the addition of the bottom cut, became as good or slightly better than time-studies showed to be the case in the same height with well-shot coal. One screen test was carefully made of the entire cut of unshot coal and a similar test with the next cut shot. These tests showed 17% less minus 3/16-in coal and 100% more plus 4-in block in favor of the unshot coal.

Both Output and Quality Good

From the time Hendrix was started until the cleaning plant was finished the coal was trucked from the various sets of entries to a temporary loading station, where it went into the railroad cars as mine-run. During this six-month period all sets of entries were driven entirely without drilling and shooting except where two thin areas were encountered and top rock had to be shot down. Results obtained in tons per man and quality of the coal were very satisfactory, but the operation was discontinued when the new cleaning plant was completed so that maximum tonnage could be realized from all equipment available on a three-shift basis.

Of course, the same total tonnage could have been obtained by buying enough additional cutting machines so that the loading-machine and shuttle-car equipment on hand could work three shifts and thus provide the same total tonnage. This, however, was felt to be unwise despite the good results obtained, because if and when any more equipment was bought it probably would be continuous mining machines and not standard cutting machines.

When continuous mining machines are purchased for this mine, it is expected to convert some of the sections back to unshot coal, utilizing the loading-and-cutting machinery that will then be available for that service. From results already obtained, it is expected that this type of setup will give the continuous machines some real competition.

Another similar experiment was conducted at Mine 214, which also is in the Elkhorn No. 3 seam. The middle parting varies from 4 to 20 in, and the bottom coal is blocky and burned to the floor. Top coal 16 in thick and supported by two crossbars is used to hold the very-bad roof. In entries that are to be tracked the top coal is taken down, along with whatever drawslate comes with it—usually 8 in or more.

Two Cutting Patterns Used

Two different cutting patterns were used, as shown in Figs. 3 and 4. Here, again, a slower cycle required three shifts of cutting to two of loading. A face crew of nine men was used: one on a 14 BU Joy loader, two on two cable-reel shuttle cars, three on 11 RU Sullivan cutters (including half the off-shift cutting), two on a Baker timbering machine and one at the loading point, the latter necessary to break the large slabs of middle parting as they went into the cars.

Loading Rate Nears Shot Coal

With this setup 200 to 225 tons per loader-shift was produced with about 1 hr less face time than for the similar experiments at Mine 204 and at Hendrix, which were only a few hundred feet in from the portal. Rate of actual loading at Mine 214 was very close to the rates shown by time-studies to have been achieved with shot coal. No screen test was made. Since Mines 214 and 204 used the same preparation plant, here, again, the method was discontinued for the same reason given for Mine 204, namely, the inability of the cleaning plant to properly handle as much dirt in the extreme fine sizes as was made by the increased shearing through the parting.

In all instances the results at the face were very good, with better tons per man than with the conventional setup. No noticeable increase in breakdowns or maintenance cost was experienced, although there is certain to be more cutter maintenance cost because of increased cutting. The experiments were discontinued only because of cleaning-plant limitations at two of the mines and because of total tonnage requirements at the third mine from the equipment on hand and available for use.

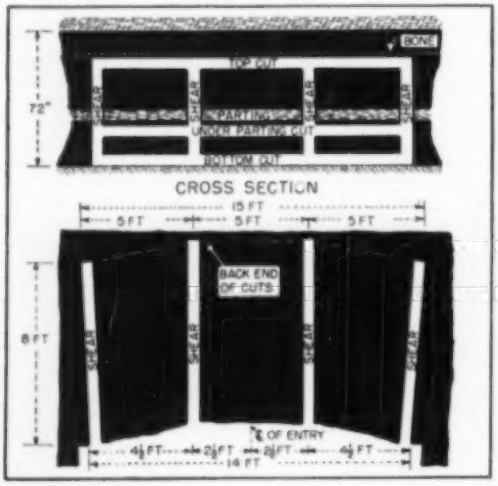


FIG. 3—CUTTING PLAN AT MINE 214 under roof coal. Bottom cut was made first, middle cut next, top cut and shears last.

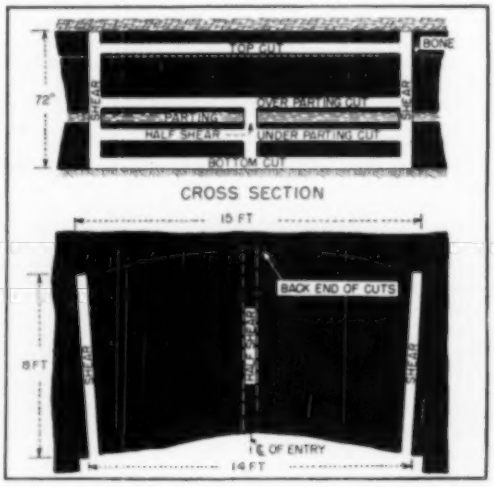


FIG. 4—CUTTING PLAN AT MINE 214 where top coal and draw rock were taken with the coal. Cutting order was same as Fig. 3.

DEMONSTRATION and practical application are used extensively to impart required knowledge to the men. H. A. Schrecengost, Bureau of Mines instructor, shows a group of Woodward Colliery employees how a safety lamp operates in a methane-air mixture.

Anthracite Trains for Safety

Closer Adherence to Safety Standards and Mine Laws, Increased Cooperation, Better Supervision, and Less Hardship to Accident Victims and Their Dependents Are Benefits of This Bureau of Mines Program

TRAINING anthracite mineworkers to recognize hazards and to take prompt corrective measures to eliminate these hazards is the purpose of an accident-prevention program now being presented in the anthracite field by instructors from the Wilkes-Barre branch of the U. S. Bureau of Mines' safety and coal mine inspection division.

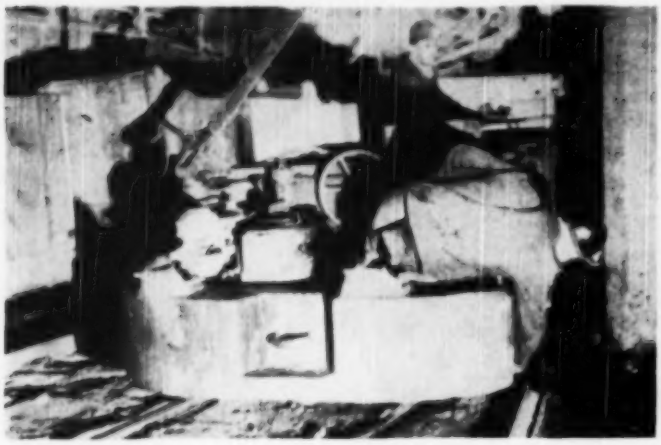
ILLUSTRATED DISCUSSIONS make instruction in accident-prevention stick. Instructor D. M. Hart uses slides to teach recognition of electrical hazards.

Closer adherence to safety standards, improved employee relations, lower costs of compensation payments and premiums, better supervision, and, above all, less suffering and hardship for victims of accidents and their families are the goals of this training effort. Such benefits can be obtained when the knowledge of accident causes and remedies reaches as many workers as possible.

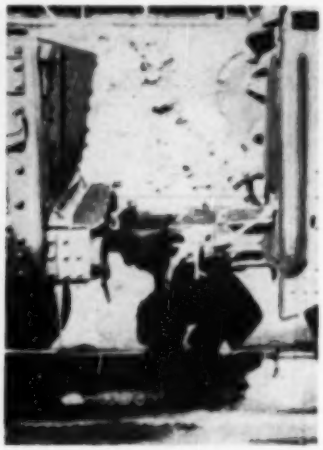
From Oct. 1, 1947, to Jan. 15, 1950, a total of 4,879 men participated in a series of 16-hr courses in accident prevention presented at convenient places throughout the anthracite area. Other instruction centers have been set up since Jan. 15. Consequently, the total number of men served is increasing. In addition, 361 mine safety committeemen completed a 20-hr course of instruction in accident prevention and familiarization with federal safety standards for anthracite mines as presented in Bureau of Mines Information Circular 7449.

The training program was developed by personnel of the Bureau of Mines to assist the United Mine Workers of America and anthracite operators to fulfill a provision of the June 6, 1946, wage agreement,

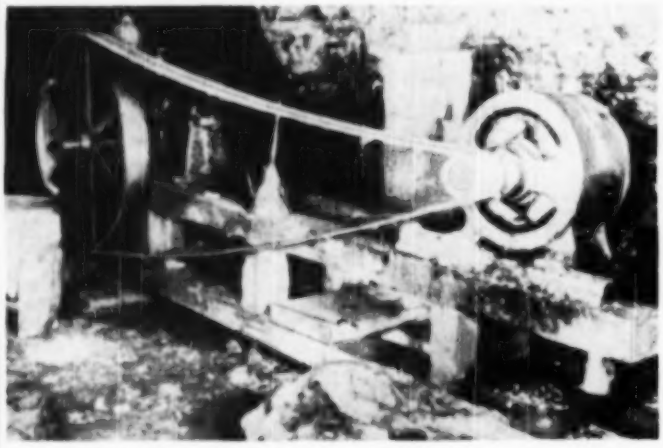
These Visual Aids Show On-The-Job Do's and Don'ts to Mineworkers . . .



HAULAGE is second only to falls of roof and coal as a cause of injuries and fatalities. Elimination of bad practices like this will reduce haulage accidents.



TAKING CHANCES, such as this, to save a little time and effort is discouraged.



UNGUARDED MACHINERY should be enclosed and good housekeeping must be the rule. The training message is—recognize the hazard, then correct it or report it.

under which federal safety standards were accepted by both parties. Separate instruction outlines are available for groups of surface employees, underground employees or supervisors, but most of the effort in this type of training is directed to underground employees because of the greater number of hazards facing them.

Discussions and demonstrations through which the material is presented stress personal responsibilities and the corrective action to be applied in reducing accident frequency. The aim of the instruction is to develop in each man a positive attitude toward recognizing hazards and then doing something about them. Major causes of accidents are studied in the order of their influence, as reflected by accident records in the past. Main points developed in the course for underground employees are as follows:

1. **Falls of Roof and Coal**—Constant attention to changes in the character of the mine roof, intelligent testing habits, good timbering at the proper time, alertness to gas and water accumulations, and prompt reporting of bad conditions to supervisors will help to reduce accidents and injuries from this major cause.

2. **Haulage Accidents**—Good work habits, teamwork among all crew members, and strict attention to maintenance of roads, equipment and clearances are necessary to assure safety and efficiency.

3. **Explosives**—Safety in the storage, handling and use of explosives is a result of complete personal knowledge of approved practices and proper respect for these materials.

4. **Mine Fires and Explosions**—Complete knowledge of the functions and design of the flame safety lamp and its use as a methane detector is essential. Good ventilating practices for diluting and sweeping away methane, and elimination of sources of ignition will break up the fire-generating triangle. Barricades, built in the right place, may save lives in the event of fire.

5. **Electrical Equipment**—Sound installation, good grounding, adequate safeguards, efficient maintenance and frequent inspection make equipment safe. Knowledge of electrical circuits, adequate protective clothing, and caution while working around electrical equipment will keep the workman free from injury.

6. **Miscellaneous**—Injuries from harmful dust, moving machinery, improper lifting, open lights and other mining hazards can be reduced by recognizing the danger and then co-operating to remove it.

7. **First Aid**—A knowledge of the fundamentals of first aid may provide an opportunity to save a life or alleviate suffering if an emergency does occur.

Overall administration of the program is the responsibility of E. H. McCleary, chief of the Wilkes-Barre

LOOSE CLOTHING caused this predicament. It could be worse, and it usually is.

DOING A JOB the wrong way (left) can only lead to trouble, but students in the accident-prevention classes learn to work the correct, safe and efficient way (right).

branch. Class organization and instruction is in charge of H. A. Schrecengost, and he is assisted by H. F. Wilson, D. M. Hart and H. P. Landis, all of Wilkes-Barre.

Messrs. Schrecengost and Wilson were trained at the Pittsburgh Station of the Bureau of Mines prior to initiating the program in the anthracite field. Visual training aids, such as motion pictures, slides and demonstration kits are used wherever possible to convey the safety message. Practical exercises in the care and use of the flame safety lamp and in artificial respiration are a definite part of the training schedule for every man.

Promotion of the program is a co-operative effort among officials of the Bureau of Mines, safety departments of the United Mine Workers of America, and safety engineers of the anthracite producing companies. At the time this was written, the program had been presented in each of the three anthracite districts of the UMWA, and employees of 10 companies had received Bureau of Mines certificates for satisfying the prescribed requirements.

Getting the course information to men unable to attend the regular sessions was done in one area through a local newspaper. The Lansford, Pa., *Evening Record*, serving Panther Valley communities in Carbon and Schuylkill Counties, carried the complete course in daily installments during late April and early May, 1948. These articles were prepared in such a way that every member of a miner's family could become acquainted with mining hazards, thus increasing the impact of the material.

M. J. Kosik, president of District 1, UMWA, Scranton, Pa., organized a permanent safety department in the district office on Jan. 3, 1949, in line with the policies of the international offices of the UMWA in Washington. Charles Kaczinski was appointed safety supervisor in charge of this department, thus becoming the first such official in an anthracite district of the UMWA. District 1 includes the locals in Lackawanna and Wyoming valleys, or the northern field. It is the largest of the three districts in area and membership.

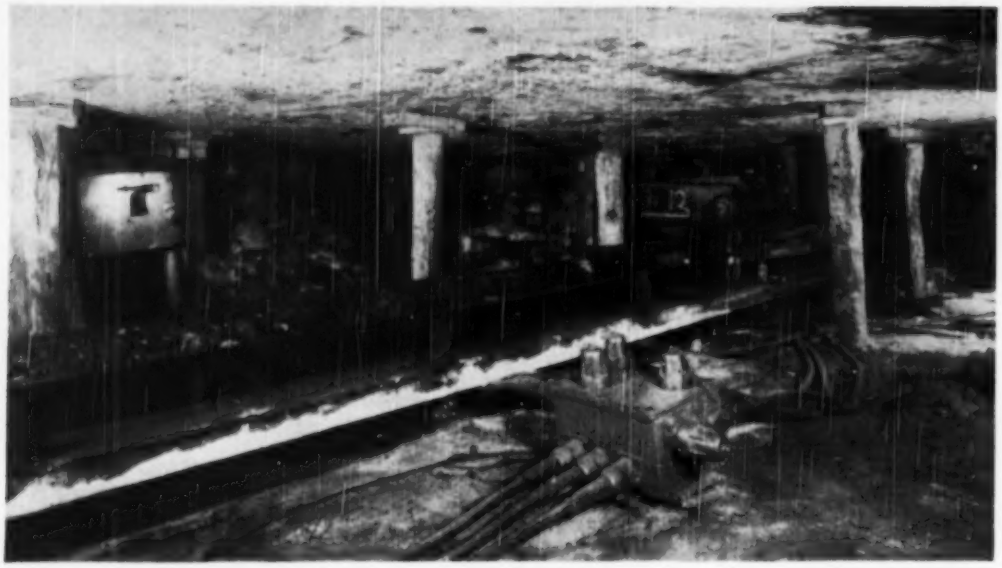
A 14-point program was instituted to guide the district in its safety promotion aims and Mr. Kaczinski is charged with supervising this program. The first goal was training 322 mine safety committeemen representing all locals in the district. Training consisted of the 20-hr course presented by Bureau of Mines personnel, as previously outlined.

Other goals in the program are (a) fostering better cooperation among management, labor and federal and state inspectors on matters relating to safety, (b) encouraging closer compliance with federal safety standards and state mining laws, (c) promoting close cooperation between mine-safety committees and mine management in the detection and elimination of hazards, (d) urging union members to take an active part in safety activities, and (e) promoting discussion of accident-prevention measures at local union meetings.

Federal inspection reports are discussed at meetings of mine-safety-committee members, mine management and the federal inspector who made the inspection. Any discrepancies with the federal safety standards are discussed with all interested parties present, and recommendations are presented for removing the differences. Such calm discussions have resulted in on-the-spot clearing of over 37% of the discrepancies to the mutual satisfaction of the conferees.

Employee interest in the course is evidenced by the fact that 100% of the workmen at Laflin, Delaware and Pine Ridge collieries of The Hudson Coal Co. received Bureau of Mines certificates, as did 96% of the men at Baltimore colliery of the same company. A total of 1,331 men of the 3,903 employees of Lansford, Coaldale, Tamaqua and Nesquehoning collieries of Lehigh Navigation Coal Co. completed the course. Other companies with trained employees are Payne Coal Co., Glen Alden Coal Co., Pennsylvania Coal Co., Lehigh Valley Coal Co., Pringle Coal Co., Cranberry Mining Co., Philadelphia & Reading Coal & Iron Co. and Phoenix Coal Co. Classes are now being conducted for employees of Locust Coal Co., Jeddo-Highland Coal Co. and Hammond Coal Co.

Periodic "refresher" meetings are held in some areas to keep the intent of the training in the minds of the men. The ultimate goal of everyone concerned with the program is to have as many trained men as possible at each mine in the region.



NEW PROTECTIVE EQUIPMENT AT OTSEGO includes entry gang box (foreground) and room-neck-breaker safety circuit center (left).

AC Ground Protection at Otsego

Change From Solid Ground to Breaker-and-Ground Trip System Enhances Protection at Operation Pioneering All-Belt Haulage and AC Service—Dry-Type Transformers Adopted for Greater Safety and Efficiency

By HOUSTON GRAHAM

Superintendent, The Brule Smokeless Coal Co., Otsego, W. Va.

TWO YEARS' experience with new underground electrical distribution equipment has convinced officials of the Brule Smokeless Coal Co., Otsego, Wyoming County, W. Va., that the hazards of shock and fire and the chances of damage to mining equipment can be greatly reduced. The mine is now 100% on safety-distribution centers.

Brule, one of several coal-mining operations of Oglebay, Norton & Co., Cleveland, for which M. A. Williams, St. Clairsville, Ohio, is field manager for coal mines, pioneered in 1936 by opening Otsego mine with conveyor transportation from face to portal and with all inside equipment operated by ac.

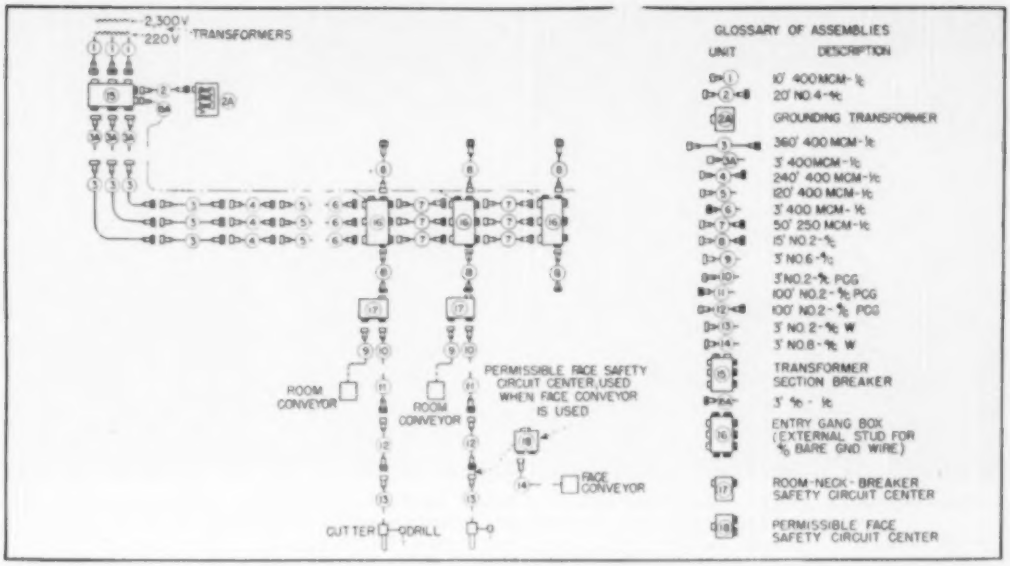
Workings on this Pocahontas No. 6 seam averaged slightly under 30 in, and the mining method was hand-loading onto chain-type conveyors. Present workings are in the Pocahontas No. 3 seam, averaging 38 in, and the same transportation and mining methods are used. The seam lies nearly level and, although the mine is a drift operation, it is classed as gaseous.

Early Practice—Power at 2,300 v is taken into the mine and distributed via a three-conductor cable laid on the mine bottom. In the original installation all underground motors were operated at 440 v and the transformer banks were connected with their secondaries Y. A solid ground was carried from the beginning, starting with a ground buried in the creek and including ground rods every 2,000 ft in the mine and ground connections to the frames of all machinery, breakers and gang boxes connected thereto.

In 1942, to reduce the shock hazard, the room conveyors, face conveyors, shortwall mining machines and hand-held drills were changed from 440 to 220 v. Solid grounding was continued as before, including ground conductors in floor cables and trailing cables to the face equipment.

In 1944, as a result of an electrocution underground, officials of the company began a search for a system safer than solid grounding, which was adapted from the widely accepted practice recommended by the underwriters for stationary equipment in all industries. The aforementioned fatality resulted from failure of a transformer bushing and the grounding of a 2,300-v line to a transformer frame, thence through the solid ground wires to the frames of conveyors and machines. The man was standing on a pan section of a belt-conveyor line and touched a 440-v wire or terminal. Thus he was subjected to a resultant voltage from the 440- and 2,300-v lines.

Ground-Trip Installation—During the 1947 Coal Show in Cleveland officials of the coal company held conferences with Electrical

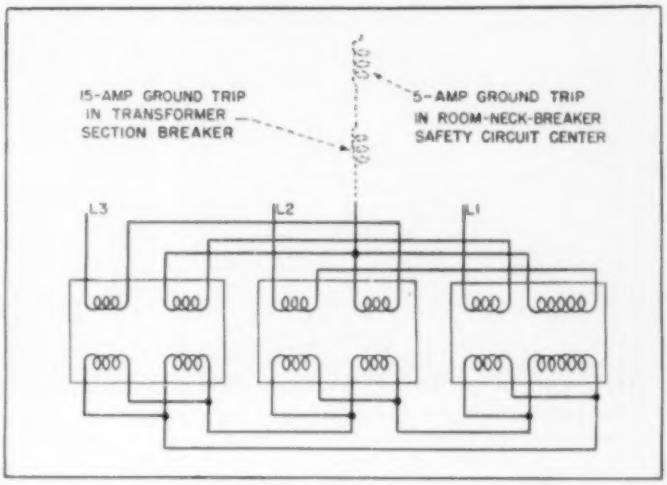


OTSEGO PROTECTIVE PLAN, showing distribution and protection between underground ac substation and face equipment.

Engineers Paul Barlow, of the Mines Equipment Co., now Mines Equipment Div., Joy Mfg. Co., and Thomas R. Weichel, then with the Bureau of Mines and now with the Hazard Insulated Wire Works. A plan including ground-trip breakers was worked out and, after getting approvals or recommendations from the W. Va. State Department of Mines and the U. S. Bureau of Mines, the Mines Equipment Co. was commissioned to furnish a set of boxes and special cables for one section of the mine. That equipment, put into use in September, 1948, has proved effective against shock, single-phase operation, burning cables and other fire hazards.

At this point it seems appropriate to go back and briefly describe a belt fire in the mine April 20, 1947; in other words, during the period of search for a safer system. While no one was in the mine, a 220-v three-conductor braid-covered cable lying on the floor alongside a 26-in cross-entry belt shorted or grounded and set fire to the lower run of the belt. The fire traveled 600 ft along the belt conveyor but did not ignite the coal ribs. A slate fall 40 ft long extinguished the fire, which had consumed 1,200 ft of belting and 600 ft of three-conductor cable.

Present Protective System — In the protective system now used, the transformers in each substation are still connected delta on the 220-v side. However, a special transformer installed in a steel box has created a neutral for each substation, to which the ground wires are connected. Another steel box contains the transformer section breaker. This is a Westinghouse De-ion unit rated at 600 amp, with overload protection and a relay to open the breaker if the current in the ground wire reaches 10 amp. Still another item in this substation breaker box is a 25-amp De-ion unit affording overcurrent protection to the grounding transformer unit.



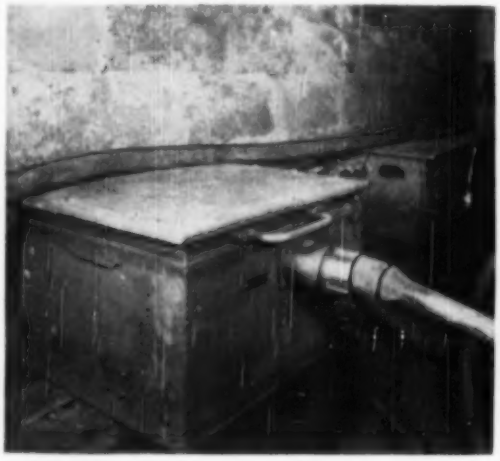
CONNECTIONS, grounding-transformer section breaker.

Between the box for this grounding transformer and the box for the section breaker the ground conductor is in a four-conductor cable. Leaving the breaker box, it is a bare 4/0 stranded copper cable.

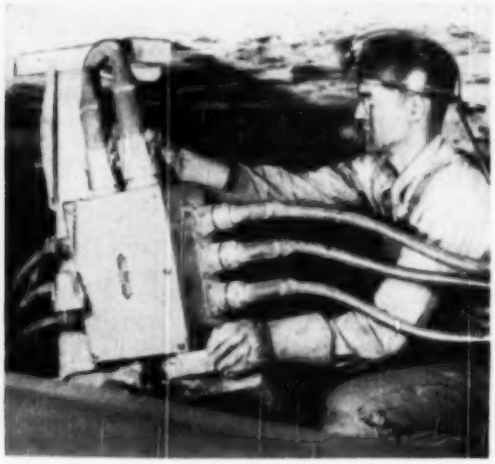
Gang-Box Set-up—Three single 400,000-cir mil conductors from the transformer-circuit breaker box feed a gang box at the nearest room-neck. This gang box feeds other gang boxes at adjacent room necks and also the room conveyor

New Protective Units Successfully Control Otsego Grounding Hazards

ROOM-NECK-BREAKER safety circuit center (left) feeds the room cable powering the face equipment and includes a ground relay tripping at 5 amp to increase protection for men and equipment with the ac system used at Otsego.



TRANSFORMER SECTION BREAKER (left) and special grounding transformer (right) as formerly installed inside the vault.



ENTRY GANG BOX raised off the floor for photographing. Cables at top feed room conveyor and room-neck-breaker center.

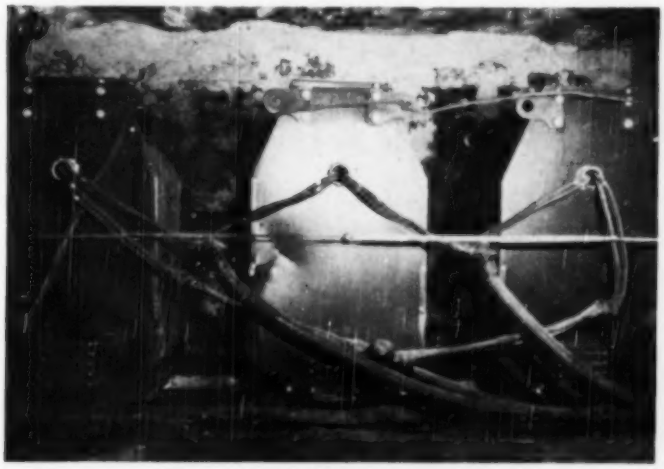
and a room-neck-breaker safety-circuit center. The latter consists of a K-frame 225-amp De-ion three-pole breaker with overload protection and a relay that will trip that breaker if the current in the ground wire reaches 5 amp.

Room Protection — The power conductors and ground wires feeding the room-conveyor and face equipment from this room-neck-breaker safety-circuit center are contained in five-conductor cables. A ground in any one of these cables or in the equipment they feed, resulting from either direct grounding of one conductor or a short between conductors (which condition would produce a ground), cuts power off the entire room unit if the ground reaches 5 amp. This precludes the chance of dangerous arcing and progressive burning of any multiconductor cable, including the trailing cables to the cutting machine and drill. A ground of a brushholder or other conductor in a motor likewise trips the breaker and prevents severe burning of the laminations or other motor-frame parts.

Including the ground wire in the cable eliminates some of the dangers encountered with the original system, consisting of three-conductor cables and separate No. 4 stranded-copper grounding conductors. Under this old arrangement it frequently happened that the ground wire broke or the men forgot to connect it.

Feeding Face Units—A nonpermissible safety circuit center feeding the face conveyor, mining machine and drill contains a Westinghouse De-ion with overload protection but without a ground-trip relay. Therefore, two circuit breakers in series provide overload protection between the transformers supplying the working section and

TRANSFORMER SUBSTATION, showing dry-type units. Lower box (right) houses transformer section breaker with ground-trip relay; top box, special grounding transformer.



THREE 37½-KVA DRY-TYPE TRANSFORMERS feeding section consisting of four room units. Combustible tape holds ventilating doors open. Moving clearance is 18 in.

motors powering face equipment.

The safety-circuit center includes shorted pilot-control equipment that will open the circuit breaker before power conductors are opened if an attempt is made to pull a face trailing-cable connector while the power is on. Current at low voltage for the pilot-relay circuit is supplied by a potentiometer with the pilot leads across a 5,000-ohm 50-w resistor between two 2,500-ohm 50-w resistors. Mines Equipment "Bigun" swivel-class connectors are used on all cables and boxes.

Production Facilities — Each transformer substation supplies a mining section consisting of four rooms 35 ft wide on 40-ft centers, driven 300 ft deep on the near side and 350 ft on the side measured across the air course. Four of each of the following units constitute the load on each underground transformer substation: Jeffrey 35-B shortwall cutting machine, Jeffrey 61-AM chain-type room conveyor, Jeffrey 61-HG 30-ft chain-type face conveyor, and a Chicago Pneumatic No. 472 coal drill.

The room cable and the cables to the mining machines and face conveyors are four-conductor No. 2 neoprene. The 2,300-v power is brought into the mine through a 5,000-ft 7,500-v SHD No. 2 shielded neoprene-insulated cable containing three ground wires and installed along the bottom in the aircourse.

Excellent ground protection is provided by the metallic shielding over each conductor. A break in the insulation as a result of a roof fall, crushing by machinery or other cause will energize the shielding and thereby open the circuit breaker at the transformer substation on the surface.

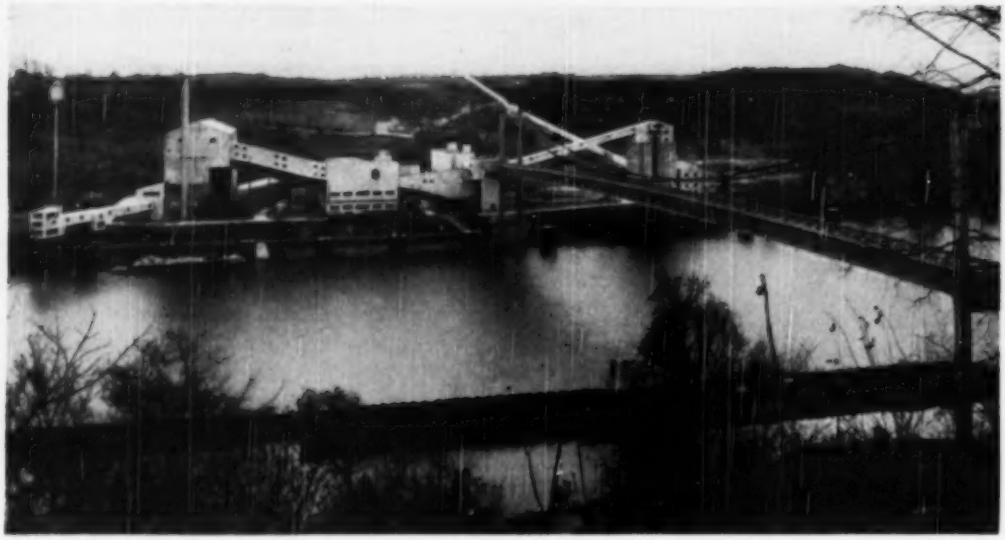
Transformer Development — During the 13 years of operation, a number of types of underground substation transformers have been used, including oil-filled and two makes with non-inflammable pyranol liquid. The latter, while they remove the danger of burning oil, were found difficult to move because of their weight and the hazard of breaking the insulators sticking out from the sides.

Some months ago a set of three dry-type transformers was installed to feed a section. Dimensions of these 37½-kva Type 75G447 units are: height, 29¼ in; width 17 in; length, 23¾ in. Their small size makes them especially desirable from the standpoint of transporting on belts where roof clearance is limited. Only 18 in above the belt is required. Voltage rating of the transformers is 2,400-4,160/240-480. Two additional banks of these transformers have been installed and it is planned to standardize on this type.

Substation Practice — The underground substations, consisting of three 37½-kva transformers and three 15-kva capacitors, are placed in concrete-block vaults with steel doors. The main door is kept closed while two small ventilating doors (gravity closing) are held open by a combustible tape stretched across the vault adjacent to the transformer and cables.

A transformer section breaker and grounding transformers originally were installed in the vault with the transformers and capacitors. Now they are placed outside the vault wall, which arrangement reduces installation and moving cost and places them where they are more convenient to maintain.

Otsego mine operates two shifts and produces 1,300 tons per day. The outby section of the main-line belt delivers directly to the tipple, which has five loading tracks and four booms. The product is a low-volatile coking coal of low ash and low moisture and a heating value of 14,000 Btu or greater.

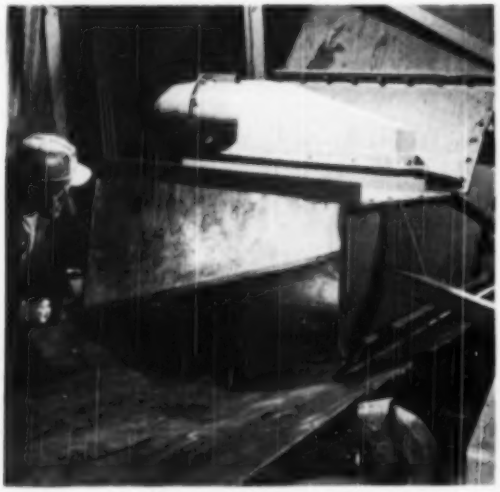


MAJOR SAVINGS THROUGH MINIMIZING PRODUCTION LOSSES AND REDUCING MAINTENANCE are expected through using alloy steel in new Vestaburg plant. Conveyor bridge carries coal from underground dump to plant across Monongahela River.

Alloy Steel Cuts Preparation

Special Heat-Treated Alloy-Steel Plate for Chute Bottoms and Liners Expected to Save Over $130,000 in Operating Cost During Steel Life at New Vestaburg Preparation Plant of the Jones & Laughlin Steel Corp.

TO MINIMIZE production losses and reduce maintenance cost, more than 500 tons of heat-treated alloy-steel plate is being used in the new Vestaburg coal-preparation plant. Now nearing completion near Vestaburg, Pa., the new plant will han-



CHUTE SIDES AND BIN BOTTOMS INCLUDED IN ALLOY APPLICATIONS. The chute at the left, from the secondary crusher, is lined with alloy on the sides. Bottom plates in the surge bins (right) also are heat-treated alloy.

ALLOY SERVES FROM THE START OF THE PREPARATION CYCLE. To resist abrasion from falling coal and rock, heat-treated alloy plates line the side walls of this chute leading over the grizzly bars to the primary crusher in the background.

Maintenance

dle an estimated 28,000 tons of raw coal per day. Use of the special heat-treated plate instead of ordinary mild steel for chute bottoms and liners, it is conservatively estimated, will save more than $130,000 in the cost of plant operation during the life of the steel.

The alloy steel being installed is Jalloy, developed by metallurgists of the Jones & Laughlin Steel Corp., which is erecting the Vestaburg plant to prepare coal from its own mines in the Washington County coking-coal region. In heat-treated plates, Jalloy has a yield strength of 160,000 psi, compared to 25,000 to 30,000 lb for mild steel without heat treatment. Brinell hardness is 341 to 388, compared to mild-steel figures of 99 to 126.

Lasts 4 to 10 Times Longer

The cost of Jalloy is approximately twice the cost of mild steel. However, previous field experience in coal mining and preparation, the company states, shows it will give 4 to 10 times longer service life in chutes and sluices than mild steel. As a result, J. & L. points to growing acceptance for numerous mining applications. Throughout the Vestaburg coal-preparation plant it is being installed wherever engineers determine that abrasion and impact resistance are determining factors in the service life of steel.

The Vestaburg cycle starts when the coal from the mine cars is discharged by an underground dump. Typical of Jalloy installations are the side plates in the chute below the car dump and the conveyor plates which form an apron-feeder belt. These plates are subject to abrasion from both raw coal and rock and slate up to 2x2x6 ft in size falling 12 to 16 ft.

When the raw coal leaves the primary crusher, it is discharged to a conveyor belt that brings it to the surface and carries it across the Monongahela River. On the other side the first unit it encounters is the secondary crusher where the coal is reduced in size. In all the operations from the secondary crushing through cleaning, sizing and drying until metallurgical coal emerges at the loading harbor and reject is disposed, beneficiation of the coal is fully automatic.

When such a tremendous volume of materials is being processed, shutdowns for large plate repairs would be extremely costly. The processes are so integrated that more than the immediate point of repair would be effected. Where mild-steel plates are used, chute and sluice liners would have to be replaced practically continuously in some phase of the process. Major plate repairs might interrupt production.

Not only are production losses minimized by the installation of Jalloy, but many thousands of man-hours of replacement time will be saved. Since only one Jalloy plate will be used for approximately four of the mild-steel plates that otherwise would be required, the time and cost replacement is reduced proportionately during the life of a Jalloy plate.

Labor Savings Impressive

It is estimated, on the basis of the current price of mild steel, that the saving in material cost will total nearly $60,000 during the life of the Jalloy plates. The savings in man-hours for replacements and in fewer production losses are estimated to exceed the savings in the cost of steel, based on minimum performance from Jalloy.

In other coal installations, Jalloy has given service longer than four times that of mild steel—some as high as ten times. As the performance proves out under the varying conditions within the Vestaburg preparation plant, the savings on Jalloy will increase commensurately.

Coal Strippers, Using Science to Speed Nature, Show How . . .

SCRUB GROWTH STRUGGLES for life in this tract of so-called "farm land" in Missouri. The fact is, very little real farm land is stripped—about 1%. In most stripping areas, topsoil is as thin as 6 in—in some places, only 1 in because of erosion—the remainder being 12 to 60 ft of clay, rock, shale, sandstone and slate. Minerals needed for plant growth are beyond the reach of roots or seeds. The result is stunted trees and bare patches of sterile earth.

TREES ARE PLANTED on banks close behind these stripping machines in Ohio, and in other states as well. Blasting, digging and dumping swell the overburden about 25%, making it porous so that water and air penetrate the soil and are retained for plant growth. Upturning the earth brings nourishing plant foods—minerals, chemicals and trace elements—to the surface, where seeds and roots can reach them easily.

NATURE TAKES HOLD. Here in Missouri, within a few years after stripping, ridges are nearly covered with trees and undergrowth, which prevent erosion and rapid run-off of water. Terrain and roads discourage fires. Lakes impound water for wildfowl, livestock, fishing and swimming. Nearby tillable land is improved with fertilizer and planted to row crops.

FORESTRY, SOIL AND FARM experts from state and federal agencies help strip-mine operators plan scientific use of stripped lands. Here in Oklahoma, with the Land Use Advisory Committee, National Coal Association, specialists give experimental plantings of trees, grasses and legumes a careful going-over. Operators in all areas follow their recommendations.

FORAGE AND WATER in abundance make cattle-raising a profitable business on stripped lands in Missouri (left) and Illinois. Strip-mine operators pay their share of taxes. While mining goes on, the state's tax take is big. After the coal is removed, stripped lands often are assessed for taxes at the same rate as before the land was mined, and sometimes even higher, indicating that stripping has not cut the real value of the land and in some cases has in fact increased it.

Stripping Builds Better Land

Smart Land Use Provides:

- Food for Cattle
- Water for Farms
- Camps for Youth
- Cover for Game

By T. C. CHEASLEY, Assistant to the President
Sinclair Coal Co., Kansas City, Mo.

IN MANY SECTIONS of our country, nature has hidden valuable minerals like coal, sand, gravel, limestone, clay, phosphate, iron and copper under a thin layer of earth. Unlike minerals deep in the ground, these deposits close to the surface are easy to get at by open-pit or strip mining—that is, by lifting off the thin cover or overburden and throwing it to one side.

Stripping is easier, cheaper and safer than deep mining. Compared with deep mining, which leaves anywhere from 20 to 50% of the coal underground to support the roof and help keep the mine safe for workers, strip mining recovers close to 100% of the coal. Besides, since deep-mining methods cannot be used unless the earth and rock covering the coal are deep and strong, stripping is the only way mining men can get at many of our coal seams. If it were not for stripping, they would have to leave a lot of coal where it lies—a valuable but unused national asset.

Naturally, the overburden material has to be disposed of somehow. In stripping bituminous coal, the overburden usually is placed by large shovels or draglines in windrows or continuing ridges in parallel arrangement. In other stripping operations, such as iron-ore mining, the overburden may have to be transported some distance and dumped or piled to permit operations to continue.

Wherever these ridges appear on the landscape, some people in the area get worried. They charge strip-mining men with destroying the beauty of the countryside, tearing up farm lands, speeding soil erosion and driving wildlife and game away. These accusers simply do not know the facts, as the pictures on these and the following pages show. Strip mining actually adds to the value of otherwise worthless farm lands, makes forage crops and trees flourish where there was only scrub growth, conserves water and turns drab landscapes into attractive recreation parks for fishing, hunting and camping. Instead of a curse, strip mining, scientifically planned and carried out, is most often a boon for the community.

The photos on these and the next two pages show how stripped land is put to good use. ➡

On Stripped Lands, Trees and Grasses Thrive and Water Is Plentiful

YOUNG LOCUSTS, three months after planting on a Missouri bank, are growing fast. Careful soil tests preceded their planting.

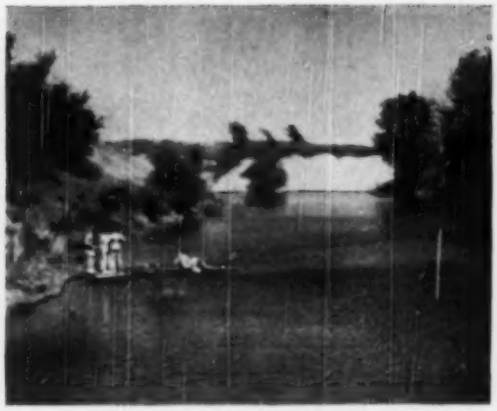
SAME LOCUSTS three years later, showing how scientific planting gets good results. State colleges here and elsewhere have helped plan best soil uses.

TWO KINDS OF PINE, three and five years old, thrive on these Alabama banks. Coal operators put up the money to carry out the experts' recommendations.

SWEET CLOVER and other legumes growing on Kentucky banks feed livestock and put nitrogen in the soil. Vegetation grows naturally but science adds speed.

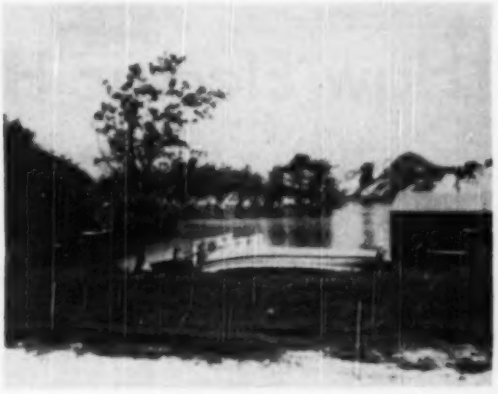
VOLUNTEER GROWTH along this strip-pit lake shore in Kentucky protects wildfowl and game. Wild rice, smartwood and sargo, sown or volunteer, attract wildlife.

WILLOWS AND RUSHES flourish along with clover and red birch in Missouri and elsewhere. Nation-wide, about 95% of bank soil is good for plant growth.



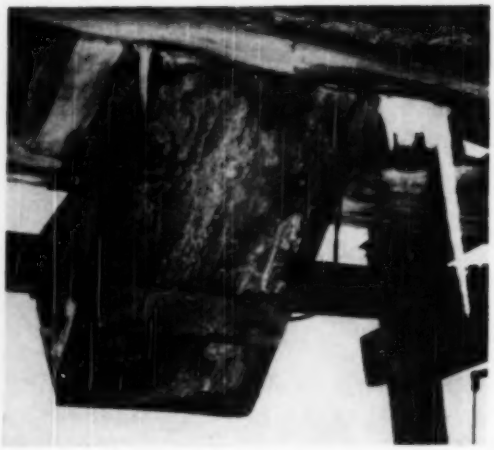
BOY-SCOUT CAMP in Oklahoma, like many in other states, is located on stripped lands donated by operators. These camps often provide the only fishing, swimming, boating and woodcraft in the area. Civic and recreational groups are interested and many new camps are springing up in strip-mine regions.

MAN-MADE LAKES, like this one in Indiana, abound in stripped areas. Fish and aquatic birds and animals thrive, for the water usually is fresh and clear.



CIVIC AND SPORTSMEN'S groups as well as private citizens have built camps and picnic grounds on strip-pit lake shores, like this one in Illinois.

FISHING IS GOOD in strip-pit waters in Missouri (left) and Kansas. Bank moisture filters into subsurface streams or into pits at lower levels. Near many worked-out strip mines, farmers report that their wells and springs, once dry, have started flowing again, indicating a rising water table in the district.



DIFFICULTIES caused by freezing of wet sludge in the bin (left), and freezing of the gate in the coal chute (right), are eliminated by 500-watt strip heaters installed at freezing points, at Cadogan mine, Allegheny River Mining Co., Kittanning, Pa.

How Electric Heat Serves Coal

Spot Applications of Electric Heat Eliminate Freezing, Melt Snow, Make Work Areas Comfortable and Promote Smooth Operation in Many Other Ways Around Cleaning Plants and Other Mine Installations

By F. F. DICKMANN

Senior Industrial Engineer, West Penn Power Co., Pittsburgh, Pa.

ELECTRIC HEAT is continually finding new jobs to do for the mining industry. Each is the product of someone's imagination. One may be the brain child of a master mechanic or electrical engineer and emerge as a homemade gadget, while another may be conceived by a manufacturer and developed as a piece of equipment for sale. Or, an electric heat application in some other industry may be found valuable in mining.

Electric heat has certain qualities that make it attractive. It is safe, automatic and convenient, and the required equipment is not expensive. Virtually all heating requirements can be satisfied electrically, but a heating dollar will buy more units of heat in coal, gas and oil than in electricity. This higher cost of electric Btu's is counterbalanced to some extent by the efficiency of electric heating over other methods. Every Btu in a kilowatt-hour can be converted to usable heat and efficiently deposited in the material to be heated, and this efficiency is not realized in heating with fuels.

Of necessity, power companies are informed of the power-using equipment of their customers. Manufacturers supply data on the power-using equipment they develop. Information on the heating devices described in this article was secured from these sources.

Preventing Chute Freezing—Considerable difficulty with the gate freezing to the bottom of a coal chute, so that a pull on the handle would not open the gate, was experienced at Cadogan Mine, Allegheny River Mining Co. This condition was corrected by mounting two 500-watt strip heaters at the place where freezing occurred. The heaters were protected by steel plates as shown. Some heat insulation on the inside of the plate is desirable. Another troublesome spot was corrected in the same manner. This application is a 20-ton bin where the sludge from the cleaning plant is discharged into a truck. Sludge enters the bin wet, and in cold weather would freeze into a solid mass if some heat was not provided. Strip heaters were attached to the four sides of the bin and protected with covers. Each of the compartments contains four 500-watt strip heaters. Even during prolonged zero weather there is no difficulty in keeping this bin from freezing, and here, also, a small amount of heat at a critical spot does a job.

Heating With Flexible Cable—Flexible cable is another useful heating device. It consists of No. 19 nichrome wire, insulated with varnished cambric and covered with a lead sheath. A 60-ft length of this cable on 110 v consumes 400 watts, or 120 ft can be used on 220 v. The operating temperature should not exceed 165 deg F.

The diagram shows the use of heating cable to keep a water pipe from freezing. The cable is bound in place with straps and covered with pipe insulation. If a greater concentration of heat was required, the cable could be wrapped spirally around the pipe. The thermostat bulb is clamped to the pipe and the

Adapted from a paper presented at the 1949 meeting of the Coal Mining Institute of America, Pittsburgh, Pa.

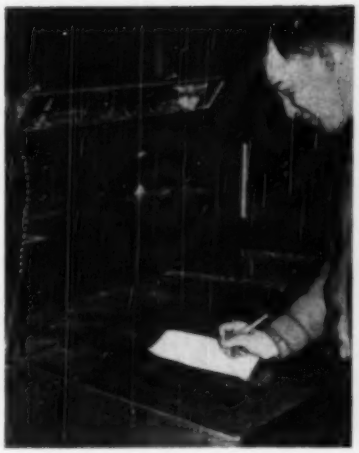
Four Pay-Off Advantages of Electric Heat

1. **Initial cost of equipment is low.** Standard heating elements are inexpensive and usually can be applied at the exact spot where heat is required.

2. **Electric heating is safe.** It can be used where an open flame is too dangerous.

3. **Electric heat is automatic.** It can be controlled easily, thus making possible the elimination of costly manpower. Thermostats and relays have a dependable memory.

4. **Electric heat is convenient.** Heating this easy way is probably more economical, too.



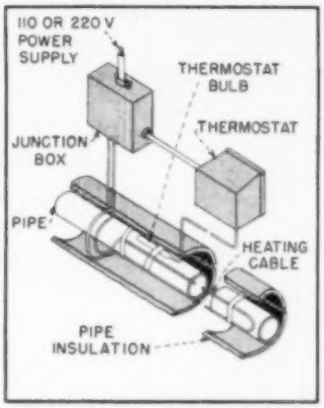
SPOT HEATING at desks in the plant or in work areas in homes in the mining community are jobs for radiant heating units. Comfort promotes better work.

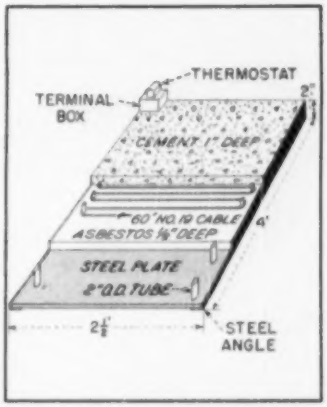
thermostat set to turn on the power when the temperature of the pipe drops below 36 deg F. Annual inspection of the thermostat is the only maintenance required.

One coal company has put heating cable to this ingenious use—an electric foot-warmer. The foot-warmer consists of a 4x2½-ft steel plate, a ½-in layer of asbestos insulation to keep the heat from dissipating downward, 60 ft of heating cable, an inch of cement and a thermostat. It is useful where a man can stand on it to perform a considerable portion of his work. It costs approximately 0.5c per hour to operate. A variation of this application is the use of heating cable laid on top of a platform scale and covered with asphalt to prevent deposits of ice and snow.

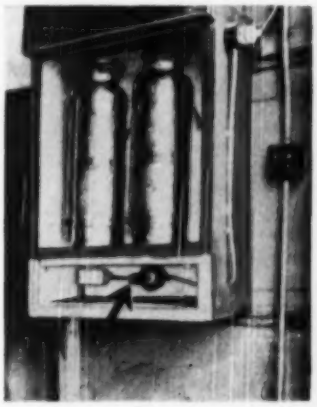
Heating With Cartridges—Cartridge heaters might well be carried in stockrooms as a supply item. This type of heater screws into a standard lamp socket and is only 4 in long. It is useful where some small enclosed space needs to be kept warm or dry. An exposed fire extinguisher cabinet is an example of such application. An inexpensive thermostat is added to operate the heater when the temperature gets below the desired level. Such a small quantity of heat is often supplied by a lamp bulb which has a limited life. Cartridge heaters last indefinitely and thereby provide an added degree of safety.

Heating Rooms—Space heating, also, is practical with modern electric appliances. A new radiant heater, with a tubular-metal-sheathed heating unit mounted in an alumi-



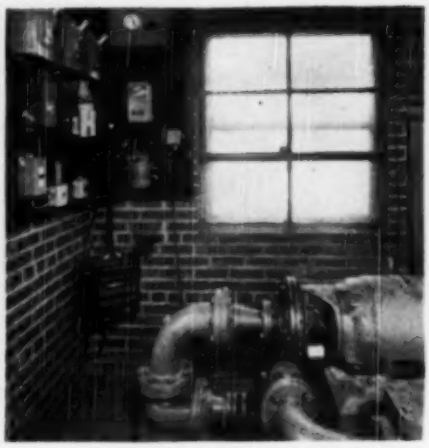


HEATING CABLE is useful in applications requiring heaters of irregular shape. Pipe heater (left) and foot warmer (right) operate efficiently and economically.

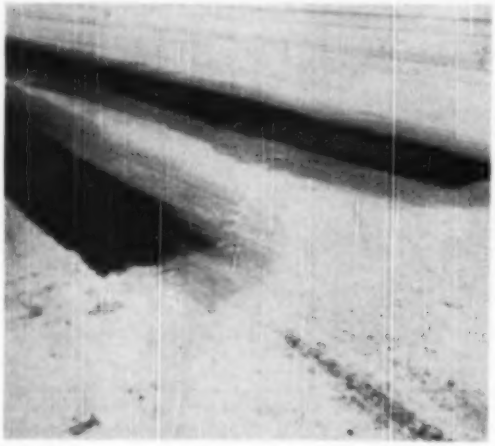


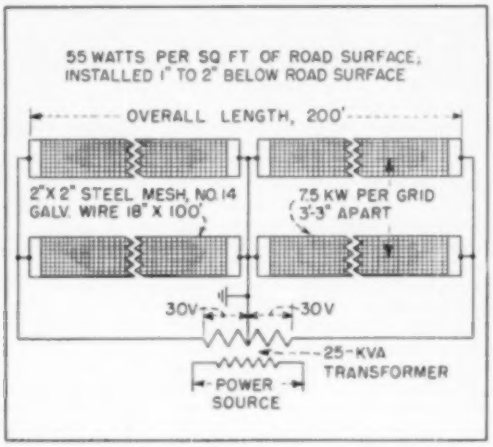
CARTRIDGE HEATER (left) can be carried in stockrooms as standard equipment. It will keep a small enclosed space warm and dry, such as the fire extinguisher cabinet (right).

Space Heating, Sand Drying and Insulation Baking Are Possible Uses



OFFICE AND PUMPROOM heat is provided by 2-kw circulating-type heaters in these otherwise unheated buildings. Good building insulation conserves heat and insures a good heating job from small heaters.





HEATING ELEMENT for melting snow on pavements, is a low-voltage mesh conductor laid 1 or 2 in below the concrete surface. It does a good job as shown at left. Scale platforms and sidewalks are other possible uses.

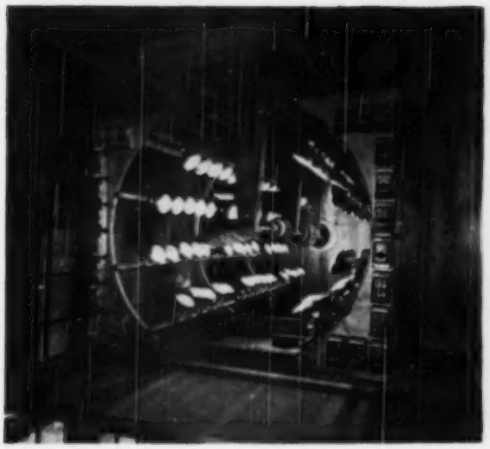
num reflector, has been developed that has a long life and can withstand rough handling. The reflectors can be fastened together with hinged connectors to make a unit of any width or curvature. These heating units, developed by Edwin L. Weigand Co., Pittsburgh, Pa., are made in lengths from 2 to 7 ft, and are useful for space heating and for drying traction sand as outlined later in this article.

Radiant heating units can be used effectively at places in the plant where certain employees keep records of various operating phases. Spot applications in tipples, scale houses and yard offices offer opportunities for such installations.

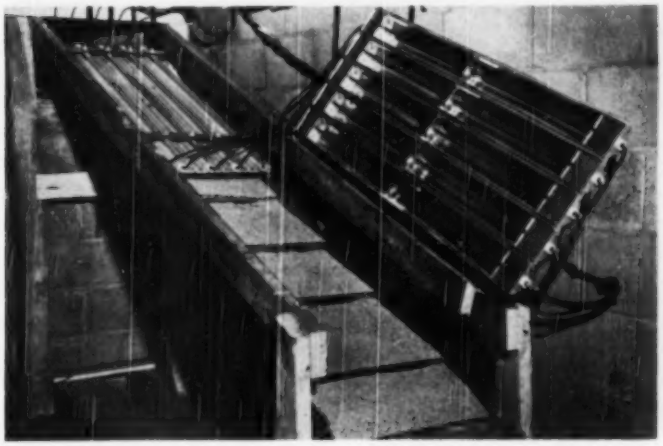
Circulating-Type Heaters also are effective in maintaining desired room temperatures. The pumproom in the photo is 10x12x8½ ft, and a temperature of 40 deg is maintained in the room when outside temperature is minus 10 deg. Two 2-kw circulating-type heaters, each with a thermostat, supply the required heat to maintain this temperature. Adequate insulation is necessary for lowest-cost operation. In this pumproom, the walls are 8 in of brick and the ceiling is insulated. Storm windows and doors help conserve heat.

The office of Sweeney Coal Co., near Greensburg, Pa., is heated by two 4-kw heaters as shown. The building is 25x8 ft and was planned for electric heating. Consequently, floor, walls and ceiling are well-insulated.

Drying Sand—Automatic electric sand dryers are among other applications for radiant heating units. Such a dryer, installed at a mine of Allegheny-Pittsburgh Coal Co., reduces moisture content in sand from 5.5% to 0.04% at the rate of 330 lb per hour. Wet sand is placed in the drum above the dryer. A Syntron vibrator on the side of the drum causes the sand to flow through an opening in the bottom of the drum onto an inclined trough 18 in wide. On the under side of the trough are two more vibrators with rheostats nearby to control the amplitude of vibration. Sand flow is controlled by the vibra-



INFRA-RED OVENS for baking armatures (left), and for softening coils during armature winding (right), have a place in repair shops. Automatic operation and reduction of insulation damage are benefits.



SAND DRYING with automatic electric heaters, at the rate of 300 lb per hr, is done by this installation at Allegheny-Pittsburgh Coal Co.

tion of the trough and steps in the trough tumble the sand as it slides down.

A bank of 10 Weigand infra-red units, totaling 18 kw, furnishes heat for drying the sand. Drying capacity of 500 to 600 lb per hour is expected from this dryer after proper insulation is installed and better distribution of sand on the trough is obtained by further experiment. Coal-drying experiments are planned, using similar apparatus.

Baking Insulation—A baking oven, employing 120 infra-red lamps as the source of heat, is in operation at Vesta No. 5 Mine, Jones & Laughlin Steel Corp. Each lamp consumes 250 watts. As many as three armatures can be mounted on the truck and baked at one time. Stators also can be handled. The two banks of lamps are movable and slide toward or away from the armatures so the lamps will be spaced the proper distance from the work. Each five-lamp group has an individual switch mounted on the front of the oven, thus making it possible to regulate temperature and handle small jobs economically. This oven is controlled by a time clock so that work can be put in the oven in the afternoon and the time clock set to turn off the heat at any desired time after shop-closing.

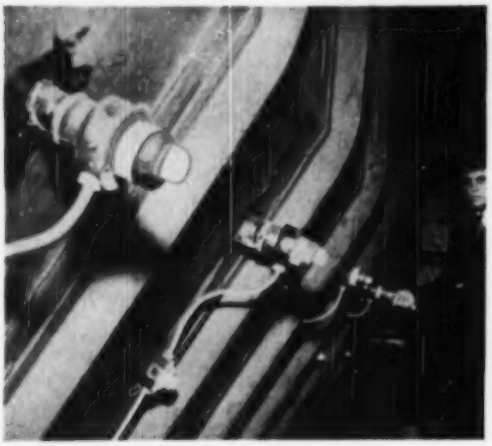
A battery of infra-red lamps also is installed at Vesta No. 5 shop to warm armature coils before they are placed in the armature slots. The coils are warmed to about 100 deg under the lamps. This softens the insulation and permits easier handling with less danger of damage to coil insulation.

Melting Snow — Snow-removal heaters have been perfected recently to keep pavements, sidewalks and ramps free of snow and ice. The heating element, laid 1 or 2 in below the surface, is a strip of No. 14-gage galvanized steel wire woven into a 2-in mesh. Each strip is 18 in wide and 100 ft long. A $\frac{1}{4}$x2-in copper bar, with terminal wires, is brazed to each end. A 100-ft strip will use $7\frac{1}{2}$ kw at 30 v. While this voltage is low enough to be safe, the wire can be dipped in insulating varnish for additional protection.

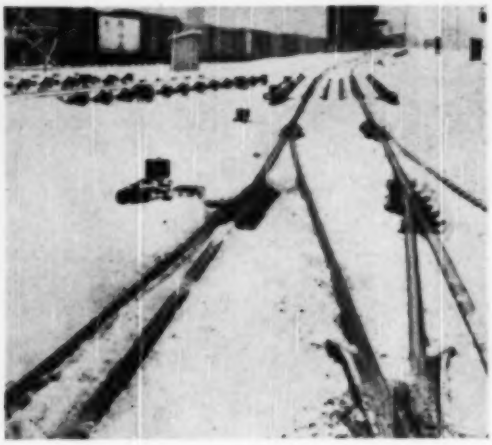
Snow and ice often make the switching of railroad cars slow and costly. The most vulnerable spots are the switch points. General Electric Co. manufactures electric melters for railroad tracks and switches and ice under the most severe conditions. These heaters are especially made to be clamped to rails and switch points. About 250 watts per linear foot of rail are required. Such an installation is manually controlled since temperature alone is not an indication of need for heat.

Heating Water—Wash-water in the modern washroom at the Vesta mines, Jones & Laughlin Steel Corp., is heated electrically. The dressing room contains 200 baskets. Wash water is stored and heated in a 1,670-gal tank installed on a balcony above the outlets. During the winter when building heat is required, the wash water is heated by

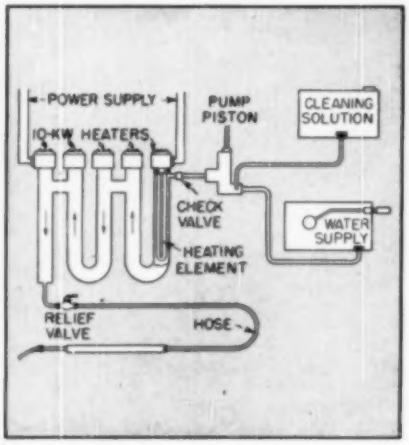
Economical Electric Heat Combines Comfort, Safety and Utility



SLUDGE SETTLING TANK, with 25,000 gal capacity, froze during non-operating periods. Immersion heaters solved the problem.



FREE SWITCHING results when manually-controlled electric heaters prevent freezing at switch points.



PERMISSIBLE STEAM CLEANER (left) employs electric heating system as shown diagrammatically (right). Heavy equipment can now be cleaned inside the mine. One man can thoroughly clean a loading machine in 3 hr.

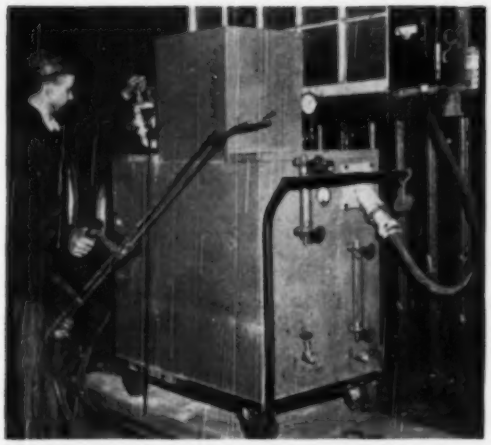
steam. During the summer the heating system is closed down and the water is heated electrically. Adequate heat insulation pays wherever electricity is used for heating. At Vesta, the tank and hot-water lines are well insulated.

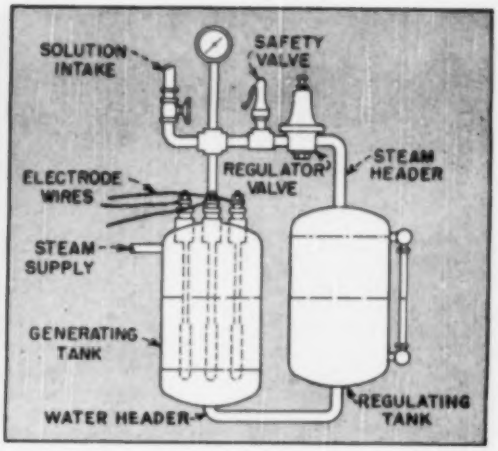
Three 24-kw heaters are connected between the hot- and cold-water headers. Three thermostats are installed in the tank, one at the bottom, one a fourth the way up and the other halfway up. As hot water is drawn off and cold water enters at the bottom, the bottom thermostat turns one heater on. If hot water is drawn off faster than this heater will restore it, the cold-water level comes up to the second thermostat and a second heater is turned on. In the same way, if cold water rises to the third thermostat, the third heater comes on. Operation is entirely automatic.

At 1c per kilowatt-hour, electrically heated water is supplied at a cost of about 80c per man per month. If sufficient storage capacity is provided in the tank so that heating can be done in the off-peak period, the cost of energy is reduced to about 40c per man per month. The controls shown in the illustration, connected to the heaters and thermostats in the tank, turn the heat on and off as required. A time clock, added to these controls, would permit heating during the off-peak period.

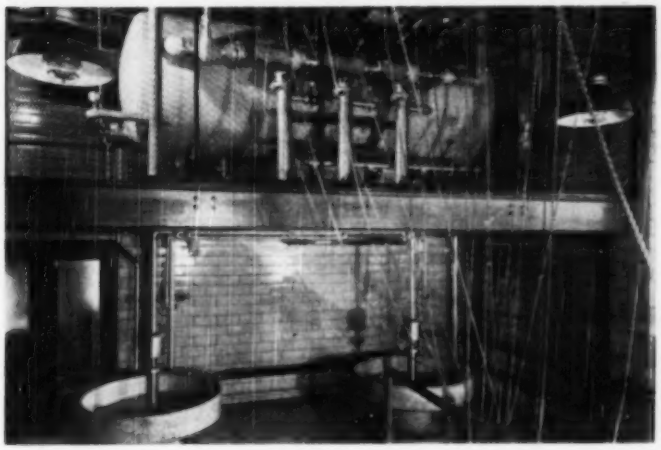
Electric water-heating also is effective in preventing frozen sludge tanks at preparation plants. At Cadogan mine, Allegheny River Mining Co., it was necessary to provide some means of preventing the water from freezing in a 25,000-gal sludge settling tank during non-operating periods. Rather than install a boiler, 10 manually controlled 2½-kw immersion heaters are inserted in the tank below the water line. The initial cost of the equipment and the operating cost are low compared to any other way of doing the job.

Cleaning With Steam — The Homestead-Yeager electric steam cleaner was recently introduced for cleaning grease and dirt from heavy equipment. A high-velocity





ANOTHER TYPE of steam cleaner (left) is designed for single- or three-phase circuits. Water is used as a resistor, and constant power-economy is a feature since water level drops on the electrodes as steam pressure rises as shown in the drawing.



WASH WATER is heated electrically during summer months at Vesta No. 5, Jones & Laughlin Steel Corp in this 1670-gal insulated tank equipped with automatic heaters.

vapor spray from the nozzle dissolves and washes away grease and dirt, leaving a clean surface. Oil-fired cleaners of this type are in common use where an open flame is not objectionable, but electric heat makes this cleaner permissible.

The operation of the cleaner is simple. Cleaning solution is placed in one tank and water in another. These are automatically mixed in the proper proportions and a small piston pump forces the mixture around a series of electric-heating elements at the rate of 1 gpm. Heaters with a total energy consumption of 50 kw are installed, but part of these are automatically controlled to operate only when necessary to maintain temperature.

At a demonstration of this machine at the Allegheny-Pittsburgh Coal Co., the input was measured and found to be 40 kw.

An orifice in the discharge restricts the flow of the cleaning mixture to provide a pressure of about 100 lb. As this mixture leaves the nozzle it flashes into a high-velocity vapor that effectively washes away grease and dirt. A warm-up period of about 10 min is required to bring the machine to operating temperature, and one man can thoroughly clean a mechanical loading machine in 3 hr.

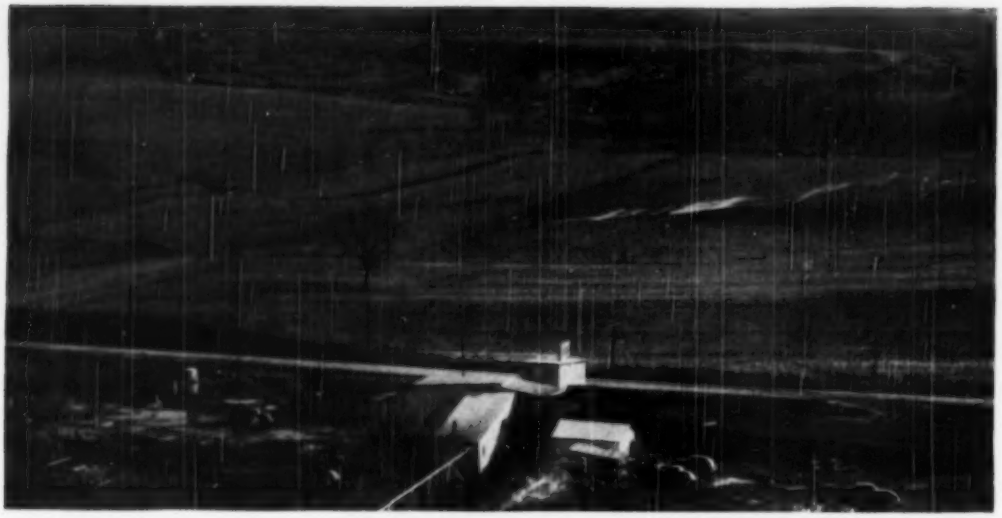
Another type of electric steam cleaner is in use at Allegheny River Mining Co.'s surface shop near Kittanning, Pa. It is built by Livingstone Engineering Co., Worcester, Mass. This machine has two reservoirs, one for water and the other for solvent. Water and solvent are mixed at the nozzle.

Heating is accomplished by a different principle. A small boiler, rated at 3 boiler horsepower, or 30 kw, contains two or three electrodes, two for single-phase and three for three-phase operation. Current flows from one electrode to another, the water acting as a resistor, and heat is generated in the water.

The heat input is regulated as follows: A second pressure vessel of the same size as the boiler is connected to the boiler in a closed circuit. As steam is generated, the pressure rises to approximately 100 psi. The water stays at the same level in both tanks since it is free to circulate between them. When the pressure reaches a predetermined point, the regulator valve closes and steam can no longer circulate between the two vessels. As the pressure continues to rise, water is forced from the boiler into the regulating tank, and as the pressure in the regulating tank increases, the steam in the upper portion condenses.

This action permits the water in the boiler to be pushed to the bottom of the electrodes and no more heat is generated in the water. As steam is drawn off, water rises on the electrodes and currents flow again.

In both cleaners electric energy is turned into heat and transmitted to the water at 100% efficiency, because all generated heat is absorbed in the liquid.



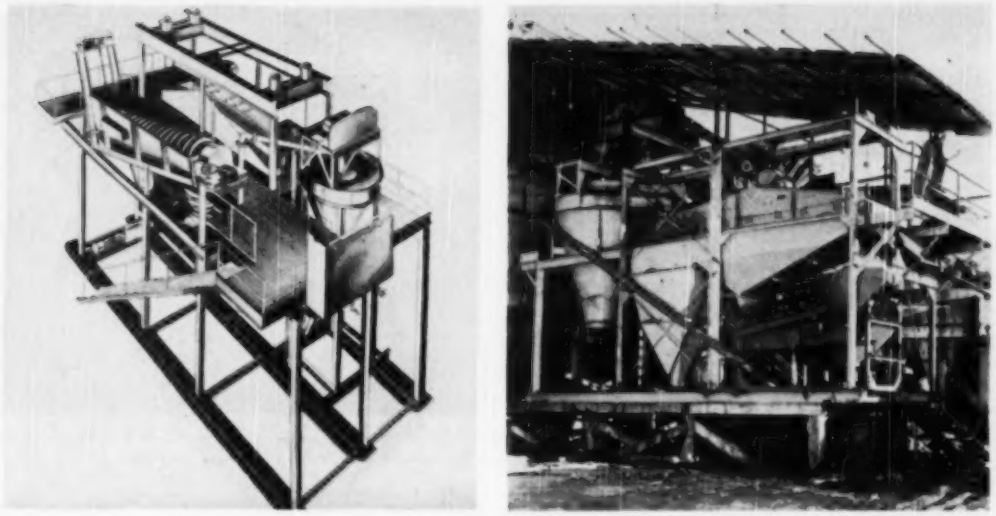
JOLIANA FROM THE AIR, with the preparation plant and service buildings in the foreground and the pit across the road. The heavy-media addition is this side of the preparation plant, with the stoker rescreening and loading plant on the other side.

Efficiency at Joliana

Heavy-Media Preparation Promotes Market Acceptance by Providing Precision-Cleaned Coal—Special Stoker Produced in Rescreening Plant—Series-Delay Shooting and Tandem Operation Promote Stripping Efficiency

PRECISION CLEANING by the heavy-media process, a high degree of flexibility in size output, and efficiency in production are the keys to service improvements that have won wide and growing acceptance for coal from the Joliana mine of R. P. M. Inc., in the Illinois

REBUILT FOR ELECTRIC OPERATION, the Joliana dragline benches off the top material down to the hard strata over the coal.



HEAVY-MEDIA UNIT (left) and how it looked in place at Joliana (right) before siding was installed. It went into operation nine weeks after the order was placed. Benefits include uniformly low ash and sulphur and a major increase in BTU content.

No. 6 field south of DuQuoin on Illinois Highway 13. Moving both by truck and over the Illinois Central R.R., Joliana coal, oil-treated, serves not only users within trucking distance but also schools, hospitals and industrial consumers as far north as Chicago and in neighboring states. In seasons of peak demand, the operation has loaded as high as 1,500 tons in a day.

The corporate name is derived from the surnames of the three principals: R. J. Roberts, D. K. Pickens and Brantz Mayor, while the trade and mine name, Joliana, was coined from the given names of their better halves. Mr. Pickens is resident manager, heading an operating staff including L. W. Travelstead, superintendent; R. P. Patrick, preparation foreman; G. M. Stewart, office manager, and W. E. Berkel, maintenance and electrical supervisor.

Box cutting and operation of the stripping dragline were started at Joliana in April, 1947, and the first coal was hauled out of the pit in October, 1947. With both materials and equipment still hard to get at that time, considerable improvising was necessary and some substitution had to be made—wood for steel in constructing the tipple, for example.

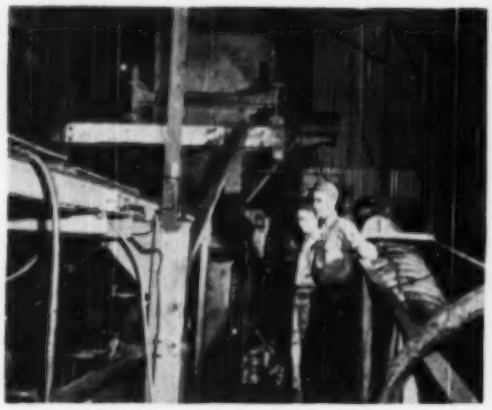
NEW HIGH-LIFT SHOVEL loads coal one shift and strips rock the remainder of the day.

PREPARATION

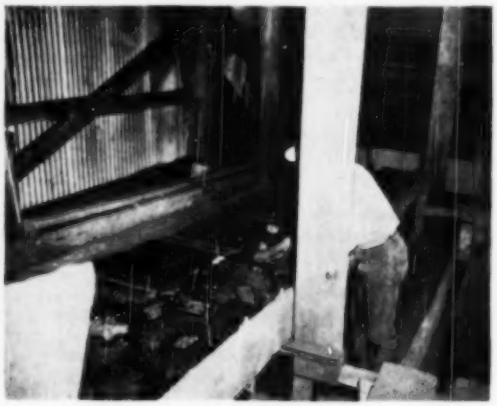
Washing facilities were not included in the original preparation set-up, reliance being placed on careful picking and screening. But while it made it possible to achieve good cleaning of the coarser coal, particularly lump and egg, handpicking inherently could not benefit the finer sizes, particularly stoker and small nut. It was not only impracticable to reduce the impurity content of these sizes, but there were wide variations from day to day and, even, from hour to hour.

As a result of inability to remove impurities and achieve uniformity, the organization was faced with a real problem of moving the product when the recent market change took place. To the management the only answer was mechanical cleaning of the sizes from approximately 4 in down. In adding mechanical-cleaning facilities, the management set up as the No. 1 coal precision results, including maximum impurity removal, a high degree of

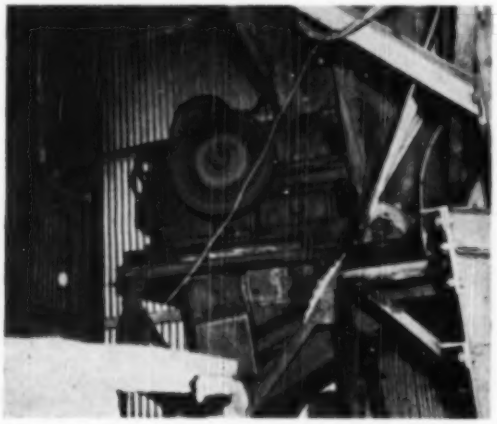
Preparation Improvements at Joliana Based on Heavy-Media Cleaning



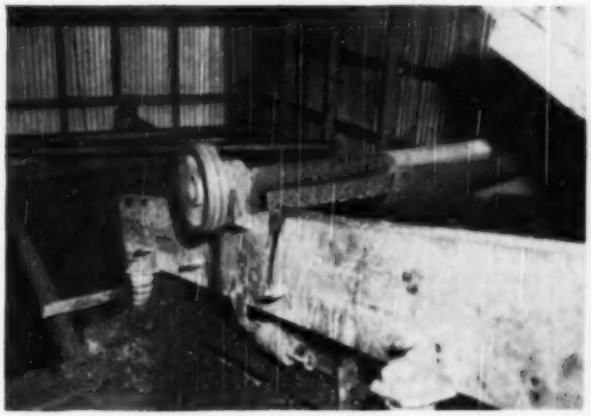
FROM THE FEED-PREPARATION SCREEN (upper center), 4x1/8 coal drops into the heavy-media cone to the left of R. P. Patrick, tipple foreman (foreground), and the plant operator. The heavy-media vessel itself is shown at the right.



A SCALPING SECTION added at the feed end of the main shaker (left) takes out 4x0 for washing. Lump and egg go on down to the picking section (right) and then into storage bins for loading into trucks.



AFTER WASHING, 4x2 coal is broken down to 2½ in (left) before return with the minus 2-in to the main screen (right) for sizing and distribution either to loading bins or to the stoker rescreening and dedusting plant.



SPECIAL STOKER PLANT includes vibrator for sizing and dedusting, and bins for storage and loading.

WAGON MACHINE drills the rock strata over the coal. At the left is L. W. Travelstead, Joliana supt.

uniformity, and maximum heat value.

Heavy-Media Adopted — To achieve this goal with a minimum of investment, operating and maintenance costs, an order was placed with the Western Machinery Co. for a No. 2C W.K.E. (HMS) Mobil-Mill with a rated capacity of 35 tph. The first such unit in Illinois, the Mobil-Mill is a prefabricated semi-portable heavy-media plant, complete with all equipment items, wiring, controls and piping in a composite structural unit. Semi-portable means that the units is fabricated with structural-steel panels, which require only field bolting for assembly.

The order for the plant was placed in San Francisco Feb. 1, 1949. The unit was shipped March 2 and received at Joliana March 13. Erection started March 18. The plant was completed 18 days later and was charged with 7.2 tons of magnetite medium April 4. Feed started April 5, or nine weeks from the day the order was placed. At no time did the erection crew, drawn from the mine force with mine supervision, exceed six men. The crew erected the Mobil-Mill, rebuilt the main shaker, installed the feed-preparation screen, built the water and sludge ponds and installed the pipe lines and transformer station, without interrupting coal output.

While the Mobil-Mill was rated at 35 tph output when purchased, modifications and minor equipment additions have increased the capacity to 60 tph output with equal cleaning results. However, at this increased tonnage, magnetite consumption is increased from about $\frac{3}{4}$ to $1\frac{3}{4}$ lb per ton.

READY FOR THE STRIPPING SHOVEL, the rock over the coal has been shot with series-delay detonators.

Washing gravity is held at 1.46. At present the plant is producing a clean coal with an ash of approximately 8.25%, less than 3% sulphur and a Btu of around 12,900 from a feed containing 14% plus ash and 4.5% sulphur, $2\frac{1}{2}$% of which is organic. In the area where Joliana operates, the Illinois No. 6 coal is reported to have an inherent ash of approximately 6%, with around 6% moisture.

Preparation Set-up—The Joliana plant consists of three main sections: (1) the tipple proper, serving for coarse-coal preparation, (2) the heavy-media plant and (3) a separate stoker rescreening, storage and loading plant. One man operates the heavy-media plant, which is powered by 14 motors, or one each for the following: feed-preparation screen, cone agitator, coal-rinsing screen, refuse-rinsing screen, circulating pump, clean-medium pump, densifier drive, discharge pump, clear-water pump, refuse conveyor, crusher, stoker drive (heating plant), m-g set and magnetic separator for medium recovery.

Coal brought from the pit is dumped into a 20-ton hopper if space is available. Otherwise, the truck

dumps over the side of the ramp to a raw-coal storage pile which can accommodate up to 6,000 tons. On the second shift, if demand justifies multi-shift operation, a Koehring utility dragline is brought up to pick up the coal and deposit in the dump hopper. A new Hendrix lightweight bucket was recently purchased for this machine, which also performs other odd jobs as necessary around the operation. Plans also call for installation of stocking and reclaiming conveyors to increase the capacity of the raw-coal storage and facilitate loading directly from this reserve for customers who desire the unprepared product.

From the dump hopper, a feeder and short belt carry the coal to a combination screen and picking-table. A scalping section was added at the feed end of the screen, as shown in an accompanying illustration, to facilitate taking out minus 4-in for washing. Plus 4-in flows on down the main screen for additional screening and hand-picking, eventually going into storage and loading bins for 4x8 egg and 8-in lump.

Feed Conditioning—Minus 4-in raw coal separated out in the preliminary scalping and screening operation is discharged sideways to a 3x12-ft double-deck Simplicity vibrator. The top deck is dressed with ¾-in square Ton-Cap and the bottom with ⅛x1¼-in "L" cloth. Screen pitch is 7½ deg. Approximately 125 gpm of water is used in screening out the ⅛x0. Spraying equipment consists of a 1½-in pipe with a ⅛-in-wide milled slot at the head of the screen, followed by five 7-R spray heads. Two sets of sprays, with a total of nine 7-R heads, are used on the bottom deck.

The last 8 ft of the screen is used for final elimination of fines and dewatering. The ⅛-in undersize and water flow to a sump ahead of the Wemco centrifugal sand pump, which also handles the magnetic-separator tailings. Both are pumped to the sludge pond.

Heavy-Media Operation — The 4x⅛ dewatered feed from the Simplicity screen is dropped 3½ ft into the heavy-media cone through a 12x18-in chute. This chute bottoms out at weir level, thereby preventing rafting of the sink on the floor bed. The sink, or refuse, is elevated from the bottom of the cone by a 9-in-diameter air lift and is discharged onto a 2x6-ft Robins vibrator for rinsing. It then goes to a scraper-type refuse conveyor feeding to trucks for final disposal.

Cleaned coal flows over the cone weir onto a 3x16-ft Allis-Chalmers Low-Head rinsing screen. A 2-ft extension at the discharge end is fitted with 2-in round-hole plate. The 4x2 over the extension screen is chuted to American Pulverizer Co. WC-24 ring crusher equipped with a 2½-in basket. The crusher product and the 2x⅛ undersize are combined on a belt conveyor, which elevates the coal and returns it to the main shaker.

Medium from the coal screen and from the refuse screen goes into a sump and the Magnetite is recovered magnetically. The concentrated-media from the magnetic separator is discharged to a spiral-type densifier for dewatering and storage. The density and rate of return of the medium is controlled by raising or lowering the spiral raking mechanism. The medium is returned to the cleaning cone by gravity, passing through demagnetizing coils enroute to improve the viscosity and prevent flocculation. Carlon hose buried in a trench is used to bring make-up water into the plant from the pond.

Washed and crushed coal, as previously noted, is returned to the main screen, equipped to produce a ⅛x1 stoker, 1x1¼ commercial stoker, 1¼x2 No. 3 nut, 2x4 No. 1 nut, 4x8 egg and 8-in lump.

Stoker Preparation — Provision is made for conveying the 1x⅛ size to a separate stoker rescreening and loading plant equipped with a double-deck vibrating screen and storage bins for the various products, as follows: 1x¼ domestic stoker, ¼-in dust, and 1x0 modified stoker, plus, of course, 1x0 straight-run stoker. Facilities are installed for oil-treating all sizes at the truck-loading points. At the railroad loading ramp, a hopper, feeder and belt permit shipment of all sizes of stoker and screenings size by size and car by car.

PRODUCTION

Stripping, haulage and auxiliary equipment at Joliana consists of a rebuilt Monighan 3½ T walking dragline with 105-ft boom equipped with Page Automatic 3¼-yd medium-weight all-purpose bucket; a new Manitowoc Speed Crane high-lift stripping and loading shovel with 45-ft boom, 34-ft stick and 2-yd dipper, powered by a Caterpillar D-1700 diesel; Sullivan wagon drill with Joy air compressor; RD 7 tractor and bulldozer; two war-surplus OCD pumps for floods; one 3-in and two 2-in Gorman-Rupp centrifugal pumps (hose discharges and Waukesha air-cooled engines) for normal pit service; and Dodge and Chevrolet 1½-ton trucks with 8-ton bodies, supplemented by Army 6x6 Internationals with a capacity of 10 tons.

Purchase of an additional shovel for loading was scheduled at the time this article was prepared to permit the Speed Crane to concentrate on stripping.

Dragline Improvement — Rebuilding of the dragline was addressed to converting it from engine to electric drive with modified Ward-Leonard swing. For drag and hoist, the engine was replaced by a 150-hp electric motor. For swing, a 35-kw mill-type motor was installed. Rounding out the job, air-type automatic controls were added for easy operation and higher efficiency.

Thickness of the No. 6 seam being stripped averages 6 ft. Maximum thickness of overburden handled to date has been 40 ft. The range at present is 20 to 30 ft. Total hard material normally is 14 ft, made up as follows: immediately over the coal, black slate and gray shale, 0 to 6 ft, followed by limestone up to the 14-ft limit. Where the black slate occurs, the proportion normally is half slate and half lime.

Overburden Removal—As shown in the accompanying illustrations, stripping is a tandem operation. The dragline goes ahead and benches off the clay and surface soil down to the rock. The rock then is drilled with the wagon unit, putting down 2¼-in holes on 10-ft centers. Kennametal chisel-point bits are used on the 6-ft starter steel, and Timken four-point rock bits on the 12-ft finishing steel. Maximum hole depth is 12 ft. The unit is capable of putting a 6-ft-deep hole down through the lime in 3 min, and the day before the operation was visited the drill crew of two men had put down 35 holes 12 ft deep in a shift.

Holes normally are loaded with Atlas RXL 157 explosive in 1¾- and 2-in sticks, usually 10 to 12 lb per hole. Rockmaster A-B-C delays are used for sequence breaking and better fragmentation with reduced explosive consumption.

The dragline is followed up at present by the Speed Crane, which digs and casts the rock at the toe of the spoil left by the dragline. The Speed Crane, as noted, now alternates between coal loading and stripping, but will be put to stripping entirely when the new loading shovel arrives.

How Continuous Mining Works: Its Results, Problems, Future

- How Continuous Mining Machines Have Been Modified
- What Changes Are Yet to Come
- How Mining Methods, Haulage, Ventilation, Maintenance and Manpower Are Affected by Continuous Mining
- How Tonnage Compares With Conventional Mining
- What Continuous Mining Can Do for the Industry's Future

By J. J. SNURE, Production Manager, Rochester & Pittsburgh Coal Co.

DIRECT INCREASES in the production cost of coal will amount to 35c per ton, at least, if current demands for wage increases and higher welfare fund levies must be met. The coal industry cannot absorb this increase under present methods of operation, or pass it along to the consumer in the face of competition from oil and gas. Many companies are already operating on a narrow margin, or at a loss, because consumers are buying cheaper fuels. It can be readily seen, therefore, that it is vital to have more efficient equipment and more effective systems of mining.

The importance of good, strong, effective equipment is magnified each time there is an increase in wages or a decrease in working time. Today the coal industry must have equipment which provides major simplification of operation and extremely high maintenance efficiency, and which cannot be easily influenced by the attitude of the workers. Attitude is of major importance as an influencing factor today because there is little or no incentive for the worker.

In the past, equipment has been considered the smaller part of a mechanized operation, with well-trained personnel and efficient management the greater. Today, receding realization and market, extremely high rates with all the trimmings, and the general attitude of the worker, which is one of not assisting the industry in supporting our present $15.70 average daily rate, have completely reversed this percentage. At this time, our only hope is the development of continuous mining.

Mining and Transportation Systems Limit Possible Output by Present Machines

System of Mining—Assuming that the cutting and loading equipment in use today is capable of mining continuously, the next step is to work out a system of mining and transportation that will permit the continuous miner to operate with a minimum of stops. At present, a regular room and pillar system, 25-ft centers, 15 ft wide, 325 ft deep, with shuttle car haulage, is being used. This system results in a great improvement over conventional loading. However, it is far from continuous.

Although most operating men agree that a new system of mine projection is necessary, they also agree it is impossible to definitely plan the change until we have a more efficient method of transportation from the machine to the belt or mine car, and until we have a better idea of the production limits. Experiments are being made with shuttle cars and all types of conveyors, but these have only scratched the surface of possible production and are only a temporary expedient.

It is possible that some day entries may be driven on 1,000-ft centers and that rooms may be driven from one entry to the other with a light telescoping belt and a short section of portable telescoping conveyor connected to the continuous miner. It might be possible to reverse the belt and machine and drive back to the starting butt, which would reduce moving time and cost.

Although the industry's experience with longwall or modified longwall systems in most bituminous mines has been disappointing, many able mining men are studying them for some modified adaptation to continuous mining. Many problems, such as ventilation and haulage, would be partially solved on a longwall face.

A high-capacity low-type surge-bin car is now being built, and if two shuttle cars are used behind it when the haul reaches 150 ft the operation should be fairly continuous.

Where possible, machines are being used in pairs to cut down nonproductive labor, such as the me-

Abstract of a paper presented at the 63rd Annual Meeting of the Coal Mining Institute of America.

chanic, boom man and belt cleaner, and greaser. To do this, plans for adequate and positive ventilation and spray water should be made very carefully and in advance.

The application of the miner to development work has been disappointing. Development production is only about 60% of room production and only about 50% of what was anticipated. The principal reason for slow advancement is poor transportation and difficulty in loading on curves when turning chutes. It is imperative to have a new mode of transportation for development work.

The continuous miner cannot be applied to regular entry development in seams releasing large quantities of explosive gas. It is impossible to course sufficient fresh air over a machine to cut this gas content to legal limits where there is such rapid face exposure. It is easy to see that if a miner working 50% of the time releases 1.5% methane in 15,000 cfm of air, it would require 45,000 cfm to reduce the gas content to 0.5%.

Miner Design—The miner has two fundamental parts: the cutting-and-loading head, and the conveying element. The cutting-and-loading head is composed of six standard cutting chains which run vertical to the coal seam.

The cutting head has an over-all width of 30 in. It has a vertical movement of 64 in from bottom to top and a horizontal swing of approximately 16 ft from side to side. There is a larger machine in use in high seams, and a low-type miner is being designed. The head also has a forward movement of 18 in without moving the main chassis of the machine. All head operations are hydraulic except for the cutting chains, which are driven through speed reductions by two 65-hp motors.

The conveying element consists of a short intermediate conveyor working directly behind the cutting chain and discharging into a hopper. A discharge conveyor works out of the hopper to the discharge end of the machine. This discharge may be swung right or left 45 deg.

The entire machine is approximately 25 ft 6 in long and is moved on a separately controlled crawler chassis. It weighs about 16 tons. The chain speeds are relatively high, the cutting chains operating at 500 fpm and the conveyor chains at 200 fpm.

The two shuttle cars that work behind the machine are standard cable-reel cars. The discharge end of one has been increased 24 in in length. The longer car is used as a surge bin behind the miner while the other is the transportation car.

Miner Operation—The miner rips coal from the face and loads it into the surge-bin car. This is accomplished as follows: With the head in retracted position, the miner is advanced on crawlers until the cutting bits are just touching the face in the center of the place. The head is then swung to its limit at the right and dropped until the bits are just touching bottom rock, or the level where bottom is to be made. The head is then extended or sumped forward 18 in into the bottom coal. At the completion of the sump, the head is raised vertically, shearing out coal as it comes up, until the roof line is reached. The head is then retracted to its starting position, cutting loose whatever coal may be left on the roof. This part of the cycle removes a block of coal 18x30 in by the height of seam. This is the production part of the cycle.

The coal that has been ripped out is carried by the conveyors back over the chassis and deposited into the surge car at a rate of from 0.75 to 1.25 tpm. This figure includes the entire cycle, part of which is not productive.

The remainder of the cycle consists of dropping the head down and swinging it 30 in to the left in preparation for the next cut, which is the same as the first. Six such cycles will cover the operating width of the working place, after which the entire miner must advance 18 in to start a new lift.

Considerable fine coal is left at the face because of fly coal and the inability of the cutting chains to gather all of the product. However, two dust-collecting screws, called scrolls, have been developed and added, one on each side of the cutting chain. These scrolls are doing a good job of collecting about 75% of the spillage at the front. The spillage at transfer points behind the miner is excessive and stops must be made to clean up.

At present, it is almost impossible to keep from cutting up bottom. After the first sumping cut, there is 10 to 15 in of fine coal in front of the machine. Thus, it is impossible for the operator to see the bottom. Therefore, the "feel" system is used. When the bits touch the bottom at a speed of 500 fpm, they will cut up some dirt. A control must be designed.

Transportation Problems—Haulage is a very important phase of this type of mining and must be improved before we can call the ac-

Rising Costs Dictate Early Development Of Effective Continuous Mining

A Bureau of Mines statistician described the current situation in the coal industry as follows: "For the decade prior to 1948, there was an increasing market for all industrial production and coal was necessary for everything. Those were Lewis' heydays. Now things are different. A buyers' market is becoming the rule everywhere and the coal industry is up against gas and oil competitors. Operators who 10 years ago did not want to slow production by quibbling are now fighting rising costs."

Last May I made the following observation: "In 7 to 10 years almost all coal will be mined by a machine that cuts and loads without the necessity of drilling and shooting. The exception may be mines having a preferred market or exceptional physical conditions, or properties mining large sizes for a domestic market. During the war, off-track equipment was the saving factor in permitting mines with a shortage of man power to furnish industry sufficient fuel and assist the companies whose mines had less favorable physical conditions to stay in business and make a fair profit. Today the continuous miner, or similar equipment, is going to do this necessary job, only this time the struggle will be for economic self-preservation."

There is no reason why this observation should be changed as it now stands, but in view of events in the past few months, I feel obliged to say that for most of us this change must be made at a much earlier date than the 7 to 10 years quoted previously if our industry is to retain its place in the economy.

tual process continuous mining. Frankly, we do not have the answer at present.

Getting the mined coal away from the miner is accomplished by using two standard shuttle cars. One car with a 24-in boom extension and with 15 consecutive flights out of the discharge conveyor is used as a surge bin and does not move from behind the machine. The removal of the flights eliminates spillage at the transfer point and also permits the miner to continue to work while the transfer is made.

The other car is a standard cable-reel car hauling about 3.25 tons per trip to the belt. In 42 to 55-in seams of coal, fair synchronization of transportation can be assured up to about 150 ft. Recently, a number of flights have been removed from the discharge conveyor of the transportation car. This has decreased loading time by 25 sec. It also has increased our haulage limitations somewhat. All haulage routes are laid out to have as few turns as possible.

As usual, the lower the coal the greater and more numerous the transportation problems. It is not only difficult to operate cars in low seams, but the cars cannot be loaded to capacity because the low height will not permit the discharge conveyors to be raised to a proper loading position. Studies are being made on a low-type high-capacity surge bin with both mobile and stationary short-section portable belts and short-section mobile belts. Until the time when adequate transportation has been designed and perfected, continuous mining is only a name.

Auxiliary Services Must Be Geared to Faster Advance in Continuous Mining

Maintenance Considerations—Nearly a year ago, I made the following statement: "Generally speaking, the continuous miner is well-engineered and should require few basic changes." Although numerous changes have been made on the machine, and many more will be made before the machine will live up to its name, there is no need for a change in the fundamental statement.

The two 65-hp motors and attached speed reducers are ample for the job they are built to do. The intermediate conveyor has been improved by changing from a twin-chain end-attachment unit to a single universal chain-and-flight center-drive conveyor. This conveyor and drive is not causing more than normal maintenance trouble. The shaft in the ripper bar idling head gave considerable trouble, but a new solid-type shaft is now being used and seems to have corrected the shaft problem. The sprays in the cutting head, which gave so much trouble, have been placed in other positions, making it possible to strengthen the member that carried the sprays and to fit this member over a key and bolt it more securely.

Although these changes have improved the cutting element, it is thought that additional strengthening and metal hard-surfacing may be necessary before maintenance will be economical. There appears to be more than a normal expected wear on the connecting pins of the cutting chains. The set screws in this chain also loosen rather easily, causing quite a few bits to become lost in the coal. It will be necessary to modify the present chain or adopt a new-type chain to get longer chain life and reduce the loss of bits.

To accommodate the new slack-gathering mechanism, or scrolls, it was necessary to redesign and relocate the shear jacks. The jacks themselves apparently are strong enough but the attachment chains from the jack to the frame are not strong enough to carry the load. Improvement must be made on this chain.

The discharge-conveyor frame has been strengthened in and about the fan section. Additional guards and shields have been added in the turntable to deflect spillage away from the swing chains. Originally, there was flexing in the pistons of the swing jacks, which eventually caused the packing and packing nuts of these jacks to leak. Guides have been added to both sides of these jacks to stop the flexing. The hydraulic hose outages have been cut materially by better positioning and by new-type high-pressure hoses. However, the outages from hose failures are still abnormal. Tests have shown that some of the hoses are subject to instantaneous shock loads as high as 2,250 psi, and it is believed that this peak load is the cause of failures rather than the sustained pressure under which the hose normally works.

The main turntable bearing has been changed from a bronze-plate to a roller-type bearing to reduce the swing load. Brakes have been installed on the traction speed reducers to stop the backward drift of the machine while sumping. This enables the operator to follow his sights easier and to get a full sump regardless of the hardness of the face. Considerable trouble was originally experienced with the lights as a result of vibration. This has been partially corrected by placing the lights on the main frame of the machine where vibration is less. Bulb failure, however, is still higher than it should be.

Automatic lubricators have been installed on the sumping and turntable bearings. The $\frac{3}{4}$-in pumps for operating the scrolls have been changed to 1-in and are doing a fair job. Some engineers, however, believe that the scrolls are underpowered with respect to the hydraulic motors that operate the worms.

There is need for some change in design in the hopper section of the machine at the discharge end of the intermediate conveyor. When the cutting element is swung extreme right or left, the intermediate conveyor has a tendency to throw coal over the side of the hopper and into the area in which the swing chains operate. This makes it necessary to stop periodically to clean out spillage. An attempt has been made to deflect the coal into the hopper with rubber spill boards, but the difficulty in maintaining these guard boards makes them quite inadequate.

The machine still has quite a few points that are very inaccessible from the standpoint of repair in the field. Progress on changes has been rather slow because both the mining company and the manufacturing company have the machine in production.

Ventilation Requirements—Ventilation for the operation of one or two continuous miners is comparatively simple, particularly in a retreat system. There are only one or two places advancing at a time and normally one is on each side of a belt heading. The air is taken in at the bottom, split, carried up both sides through the working places, then through the worked-out area and through regulators into the returns.

Since only one miner is oper-

ating on a side, the air is coursed up the room haulway over the equipment and men, then out behind a line curtain, carried on the side of the room adjacent to the worked-out area. This permits the crews to work in relatively dust-free air at all times. The curtain is carried as close to the working face as possible. The rate of advancement is very rapid and gas is liberated in proportion, thus necessitating sufficient quantities and velocities. Efficiency can be improved by turning crosscuts more frequently into adjacent places if roof conditions permit.

The final system of ventilation will depend on the system of mining developed to take care of an efficient transportation system. However, ventilation for the continuous miner should always be easier to plan and maintain than for the present conventional mechanical loading.

Dust Allaying—The continuous miner makes large quantities of fines. Therefore, dust will always be a problem, but one that can be readily solved by proper planning and supervision. The original machines had 19 spray nozzles in and about the cutting head and the conveyors. These sprays operated at a pressure of about 75 to 100 psi and used approximately 15 gal of water per minute. While the water applied by this method solved the problems of health and safety fairly well, further refinements were necessary.

The present miners were built with three sprays, one on each side board of the cutting head and one on the right side of the center hopper, to be operated at pressures of from 200 to 600 psi. This pressure is obtained by the installation of a high-pressure pump in the line close to the machine. Two additional nozzles have been added on the job to the side of the hopper. These two, with the original hopper nozzle, form a vapor cover for the flow of coal over the entire conveyor. Approximately 11 gal of water per minute is now being applied.

The new high-pressure vapor sprays have improved preparation because face visibility is improved so that the operator can see the top as well as locate the bottom by the position of the front of the cutting head. It was not unusual for the operator to get into the top or bottom when using the poorly located low-pressure nozzles. With the addition of more moisture comes preparation problems. Therefore, further study must be made to get good visibility, cover health and safety and yet cut water consumption to about 7 gpm.

To make sure there is little dust getting away from the machine and into the return, two or three sprays are set up behind the line curtain at a point where the return from the working section joins the return of the section. With this dust-allaying set-up, it is possible to operate two miners in adjoining rooms on the same split of air.

Production Depends on Crew-Size, Section Layout and Seam Characteristics

Man Power—The combining of several operations—cutting, drilling, shooting and loading—makes it possible to work with a very small crew. The crew of a continuous miner consists of an operator, helper, mechanic, shuttle-car driver, surge-bin operator and a boom man on the belt. This is three less than the regular conventional off-track crew for about the same production or less. There have been other variations of crew size tried but none have worked as well as this.

The operator is busy operating and watching his preparation, while the helper cleans up, sets posts and canvas and helps move cables. The surge-bin car operator takes care of the transfer between continuous miner and shuttle car and does some cleaning up around cars. The shuttle-car driver transports the coal from surge bin to belt or mine car. Experiments have been tried without the surge-bin operator but the preparation always suffered because the machine operator could not keep his eyes on the face and surge bin at the same time.

Further reduction in man power is made when it is possible to work two or more miners in a section without increasing supervision, maintenance, belt cleaners, boom men, etc. Maintenance engineers believe there should be a mechanic for each machine shift to expedite handling the many small maintenance outages—at least for the present. Also, it is doubtful if the operator can work efficiently for a full shift once the miner has reached its productive limits. Therefore, thought should be devoted to how he will be given relief.

Production Rates—Although the reduction of face men brought about by introduction of the continuous miner has increased the tons-per-man yield, the results, on the whole, have been disappointing and not what we anticipated on the first machine, as a result of operating difficulties and inadequate transportation. In 42- to 48-in coal, with an average width of 15 ft and an average depth of cut of 16 in, the coal produced in one face cycle of 4 min would be 3.19 tons, or 0.797 ton per minute.

Theoretically the production should be 47.82 tph or, with a face working time of 6 hr 54 min, the total tonnage should be 322.77, or 53.79 tons per man for a six-man crew. Actually the continuous miners in this height are producing approximately 150 tons per shift, or 25 tons per man.

When two machines are worked in a section, the production is approximately 300 tons with 10 men, or 30 tons per man. Recently, a new production figure has been set in the low coal. Two miners working on one belt have averaged 1,250 tons of material daily for six work days, and have reached a maximum of 1,390 tons, or 39 tons per man, with 32 men per day.

In a 56-in seam, the coal produced in one face cycle of 4.25 min would be 5.31 tons or 1.25 tons per minute. So far, the actual production in the higher seam has not shown much improvement over the lower seam because of inability to get the coal away from the miner.

With good transportation and the improvements noted in the preceding paragraphs, there is certainly the possibility of doubling the present production, because time studies show the machines are working only approximately 50% of the time. Although 129½ ft of room face have been driven in a shift, the average is about 60 ft.

The performance of the continuous miners in development work is so close to that of conventional cutting-and-loading equipment that practically all work with the new machines is being done in rooms. Long chutes, which make it necessary to load on curves and over the sides of shuttle cars, and operating buggies through lock checks for keeping air to faces have made it impossible to get the expected efficiency from shuttle-car haulage.

You get more dependable haulage with EXIDE-IRONCLAD POWER

You can count on instant starting and rapid acceleration when your locomotives, trammers and shuttle cars are powered by Exide-Ironclad Batteries. They help speed up car changes, keep your loaders busy and main line haulage moving fast. They give you lasting power—assuring uniform speeds straight through to end of shift. Also, with Exide-Ironclad Batteries you eliminate unscheduled down time for repairs, resulting in more production per man per shift.

The Exide-Ironclad Battery is *DIFFERENT* from all other batteries in design, construction, performance. The outstanding difference is the *exclusive* positive plate. Since 1910, this plate has continued to prove its superior operating characteristics and exceptional long life in more than 100,000 heavy-duty jobs . . . and at operating and maintenance costs that are extremely low.

Combined, the important characteristics of Exide-Ironclads provide safe, dependable full-shift power for mine haulage units, making Exide-Ironclad Batteries the best power buy . . . *at any price.*

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When I Was a Supervisor

Charles E. Wilson, President of General Electric Co., Maintains That Success in Any Supervisory Job Depends on Your Willingness to Consider People, and Not Machines, as the Major Factor in Smooth Operation

Ulby Karsh.

CHARLES E. WILSON reviews his career in American industry—from office boy to the presidency of one of the world's largest business organizations. His attitude toward the people who worked for him gets credit for this rise through the ranks during 50 years of service.

EVERY ONCE IN AWHILE somebody says: "Being president of a big company like General Electric must be a great experience."

Of course they are right. It is a great experience, a great adventure and a great responsibility, but the important thing, I think, is that you don't get that feeling from just being president. It comes from everything that went before that, on those other jobs. For instance, I think about the time I became a supervisor in direct contact with a small group of employees. The fact that I represented the company to these people made it a very satisfying experience.

I was 25 years old at the time, and if I wasn't wet behind the ears, I was certainly a little damp with a little brashness thrown in for good measure. My boss did one of the finest things for me that any boss ever could. One day he said: "Charlie, you're going to be production supervisor here, starting tomorrow."

It had been about twelve years since I joined the Sprague Company, working as office boy, in the shipping department, as time clerk, factory accountant and so on—and I was pretty elated over my promotion. To know that I was making the biggest step upward so far in the company gave me a big thrill. I went home that night just a little cocky that my superiors had seen fit to give me this promotion. I looked forward to becoming part of the management team, where I could make a much bigger contribution to the business in directing work scheduling and material ordering.

That was 38 years ago, when American industry was growing up. Being right up against a daily job, most of us were inclined to think in terms of material and machines. But I hadn't been supervisor very long before I discovered what was the real feature of my new job—it was not the material and machines, but the people that worked for me that were most important. What those people did, and what they thought could make my job successful or a failure.

No matter what your job title is, you can only contact, influence and lead a certain number of other human beings—the ones you see and work with. As you go along and pass to other groups in an organization, you leave so nething of yourself behind—and if what you leave is good enough, it makes your next job easier and improves the performance of your whole organization.

Today the biggest job in the General Electric Company, as it was in the Sprague factory, is dealing with men's minds, with their convictions and with their faith. This is a job that requires as much planning, patience and hard work as the building of a factory or entering into the engineering, manufacture and sales of a new product. And yet it is a job no bigger than the actual number of men and women that we can see, and speak to and influence in the course of our day

That is really the kind of thing you think of when you get to be a president, and I pass it along to you for what it is worth.

—Charles E. Wilson
President, General Electric Co

Reprinted from Brief Magazine, Apparatus Dept., General Electric Co.

Testing Roof the Safe Way

By TOM GETTINGS
The Lorado Coal Mining Co.

AFTER ANY PERIOD of inactivity in the mines, it is especially important to take added care in testing the roof. Because of the effects of air and moisture, the condition of the roof may change dangerously, even in a comparatively short time.

Records show that after any shutdown, accidents from falls of roof increase considerably. It is therefore necessary that each and every one of you show extreme care and caution.

Falls of roof are the most common and the most serious of all mine accidents. It is reliably reported by the Federal Bureau of Mines that about half of the accidental deaths each year, and more than 25% of all non-fatal accidents, result from falls of roof.

All Must Cooperate

This type of accident has been the most difficult to eliminate. But it must be reduced if we are to bring about greater safety in coal mining. And this type of accident can be re-

B.F.Goodrich

Universal all-nylon for jobs where traction is problem. Note 2-way tread, bulky wedge-shaped cleats.

These *Rock Logger all-nylons* were on a truck in extremely tough service for 2 years . . . are still going strong!

ALL-NYLON

tires give full service with no bruise or flex failures

THE B. F. Goodrich ALL-NYLON tire is now in use—and proving successful—in mining operations throughout the country. The record speaks for itself: *no blowouts, no bruise breaks, no flex breaks* . . . and that includes severe operating conditions in mines where flex and bruise failures formerly were common. Now, all-nylon tires are giving mine operators full service with no bruise or flex breaks.

Along with nylon, B. F. Goodrich uses weftless construction. This means there are no cross-threads to hamper cord action and allow some cords to stretch out. Therefore, tire growth is reduced; tires last longer.

Nylon tires always provide big savings for strip-mining, quarry and other operations where heavy loads and rough terrain have made tire costs high.

The new, all-nylon construction is typical of the continuous improvements being made in truck tires by B. F. Goodrich. Long ago, BFG engineers developed special types of tires for mining service. They constantly developed new improvements. One of these was the nylon shock shield, a major construction advancement now used in all B. F. Goodrich truck tires with 8 or more plies (double nylon shock shield in large, off-the-road tires).

For more information on the way B. F. Goodrich tires can do more work and save you money, see your BFG dealer or write us direct. *The B. F. Goodrich Company, Akron, Ohio.*

duced by the individual miner, working under efficient supervision.

This article deals mainly with testing roof the proper and safe way. Considerable stress is placed upon testing because of the various types of roof. Draw slate is the most unstable of all roof materials and must be taken down as the places advance. Sandstone or limestone generally makes good roof.

Because 85% of all roof fatalities occur at the working face of a room or entry, it is essential that all workmen thoroughly understand the proper method of testing roof.

It is the duty of all supervisors to see that their men know how to test roof properly. If a supervisor finds a workman under dangerous roof, he must see to it that the place is made safe. If a supervisor finds a place not timbered according to standard, he must not permit that workman to continue until the place is brought up to standard.

Efficient supervising will greatly lessen the danger of men being injured or killed by falls of roof or coal. However, it must be stressed that the individual miner is required by law to take down loose roof and to timber securely to make his working place safe.

The supervisor alone cannot insure safety. He must have the cooperation of every miner.

Effective testing of roof in a working place becomes almost automatic to a good miner. The most efficient method for testing roof is the "sound and vibration" method.

"Sounding roof" is done by striking it with a suitable testing bar or miner's pick. If the sound is hollow or drum-like, the roof is loose and dangerous and should either be taken down or else supported by timbers.

Merely "sounding" roof is not reliable by itself, and for safety it must be used in conjunction with the "vibration" method.

This is done by placing the bare fingers of one hand lightly against the roof, and then with the free hand striking the roof sharply with a suitable testing tool. The vibration of the roof against the fingers indicates the condition of the immediate roof.

All roof, faces and ribs of working places must be tested at frequent intervals throughout the shift by the method described above. This, plus strict adherence to timbering standards, will greatly reduce our accidents caused by falls of roof.

Keep this in mind: do not put too much dependence upon "good roof." Always consider all roof basically bad. Most miners will tell you that the majority of roof fall accidents occur under so-called "good roof."

Use the "sound and vibration" method of testing roof. Do it frequently, and add good timbering. That is the safe way.

—Reprinted from
The Lorain-Lorado Journal

How You Can Improve Relations With Your Men

The value of sound employee relations usually is recognized by progressive mining companies and officials, but it's not an easy matter to set up an effective employee-relations policy and put it to work so that all officials and supervisors are equipped to successfully carry out its objectives in dealings with the men under them.

One key to the problem is considering employee relations purely as "human relations" and acting accordingly, as is so convincingly demonstrated in the following memorandum to company supervisors written by J. W. Damron, chairman of the board, Red Jacket Coal Corp., Columbus, Ohio. The memorandum is reprinted from the company's publication, *The Red Jacketeer*, which recently published it to explain the company's attitude to all employees.

"There is no greater need in our industry or in the whole economy of our country than that of 'building morale through human relations,' thereby a sound employee-relations policy. The development of a strong, happy, loyal, cooperative company personnel is at the heart of such a policy.

"The greatest asset any company has is the people who labor for it. Its success or failure depends upon their performance, and their performance will largely depend on the leadership they have. Leadership must be human, sympathetic and understanding to permit the fullest possible expression and bring out the best in the ability of every human engaged in our business.

"Loyalty and cooperation, so essential to the success and well being of any company, organization or group, cannot be bought with money. It must be acquired through mutual understanding, respect and good will. The man never lived who can compel another man to work. You must get inside that man and find out how to make him want to do the job.

"A sound employee-relations policy, among other things, must be firm as well as fair, with mutual respect and discipline. Discipline must work both ways. Our leaders must become more interested in people. We must become students of people. What is fair to one may be unfair to another. We have a moral and spiritual obligation to improve ourselves to handle the greatest power on earth, the most precious thing on earth—people.

"I know that we have an exceptionally intelligent group of employees—the best in the world. Even with that, controversies will arise, differences of opinion will come up, grievances will have to be settled. Those things are only natural in the lives of men. We are supposed to be leaders. If we are qualified as such we will, on every occasion, approach issues frankly and honestly—sympathetic and unselfish in our attitude. We should rededicate ourselves to the common interest of every man and woman on the payrolls. No man is a leader save by the permission of those he leads and by their tolerance and approval. The security of leadership lies in its ability to serve the people. Win your men or you will lose them. Convince them that you are their friend, then keep their friendship *by being their friend.*

"We should listen more and talk less; give the other fellow a chance to express his views and 'get things off his chest.' His opinion deserves your sympathetic understanding and a fair hearing. Know what he thinks, what he says and what he does—Listen!

"I have great faith in the opinion-forming capacity of men when it is unselfish and honest.

"An expert on human relations has said recently that if you want to know how to improve your company, 'build better men, and better men will build better business, and nothing else on God's green earth ever did or ever will'; and further, 'business is not the management of things, it is the selection of people, the training of people, the supervision of people; it is the development of people.'

"This formula alone would insure successful operation, happiness and well being to all if it is followed through religiously. Let's try it wholeheartedly.

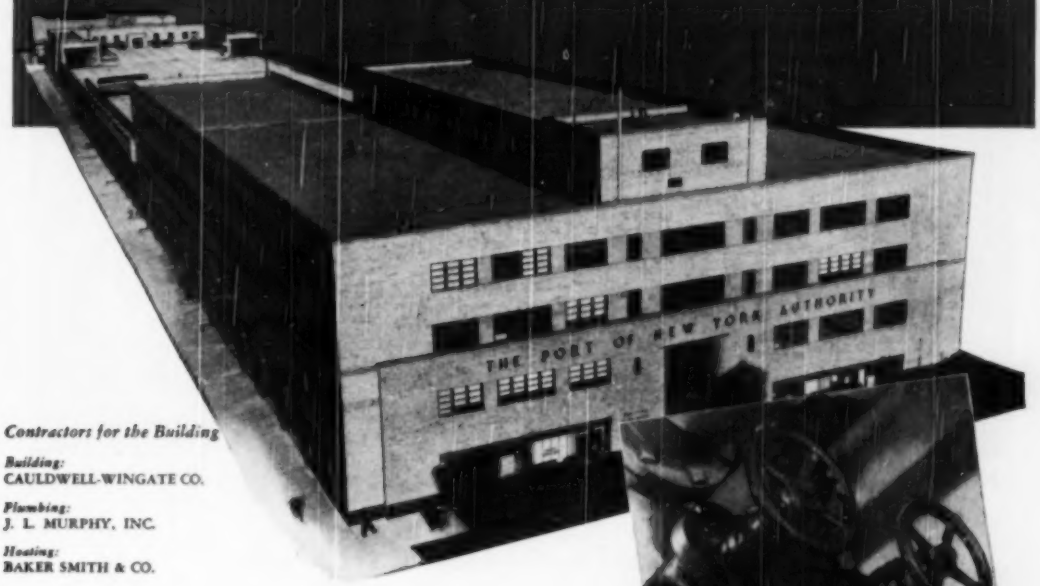
"One other thing—we will have grievances to settle, misunderstandings will arise, people will have problems. In all these matters be willing to listen with an open mind, with a sympathetic feeling, generous and unselfish in our attitude. On this basis no problem should arise that cannot be settled to the satisfaction of all concerned and inure to the benefit of our company, which is the people who labor for it.

"Always remember that men differ little—only as they work for their share of the things in life, so the individual's problems may seem negligible to you, but they are of major importance in the mind of the one affected, and he or she will not be happy until it is resolved satisfactorily. Most problems will disappear in an open, frank and unselfish discussion.

"In conclusion, it is our responsibility to conduct the business efficiently. To accomplish this we should work together in harmony. Blind stubborness helps no one. Help employees understand some of the basic facts about the business. When fully informed about their common interest they will respond with loyalty and good will."

JENKINS VALVES

for lowest maintenance cost



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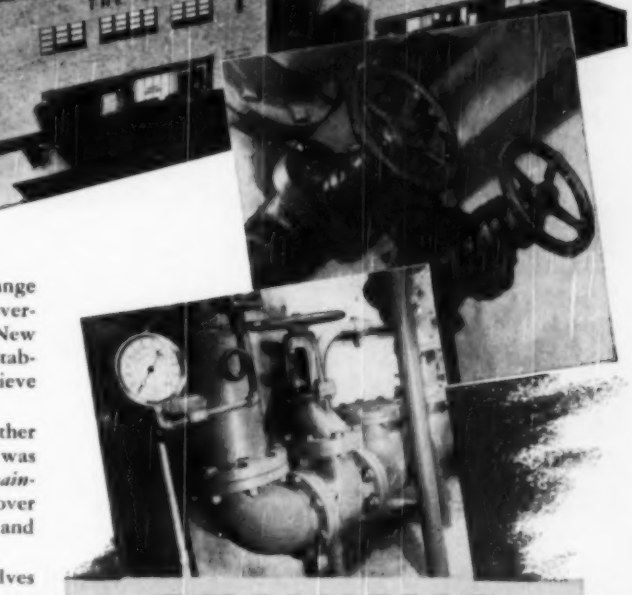

A CONSOLIDATING TERMINAL for interchange of mixed merchandise freight between over-the-road carriers and local city trucks, the New York Union Motor Truck Terminal was established to reduce shipping costs, and to relieve truck traffic congestions.

All equipment used in the terminal, whether for freight handling or building operation, was selected on the basis of *lowest possible maintenance cost.* That is why Jenkins Valves (over 2800) are installed in water, steam, fire, and other vital pipe lines.

Jenkins builds *extra* endurance into valves —proved time and again by low upkeep cost records in every type of service. Yet, *you pay no more* for Jenkins Valves, despite this extra value. Let the Jenkins Diamond be your guide to valve economy . . . for new installations, for all replacements. *Sold through leading Industrial Distributors everywhere.*

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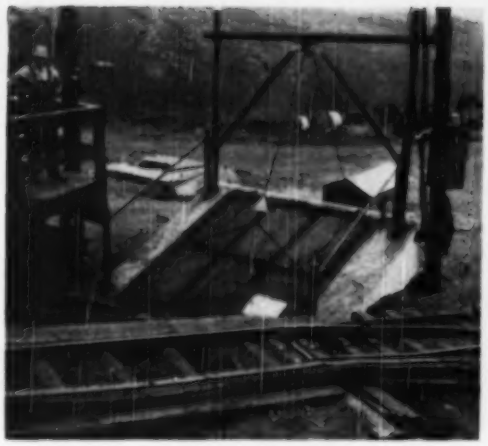
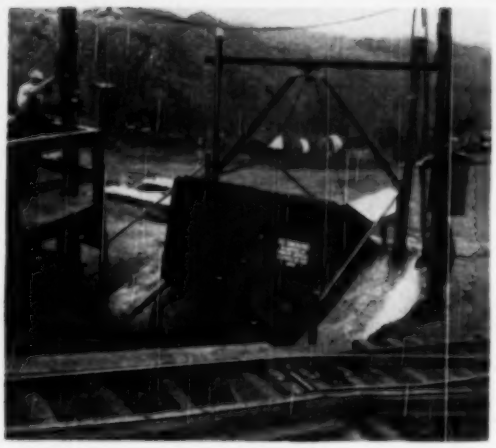
Operating Ideas



SAFETY for the slope-head attendant and a tight seal on the slope mouth are provided by the steel door shown here.



REMOTE CONTROL, with push-button stations at fingertips of attendant and engineer, reduces possibility of damage.

Keeping Ice Out of Downcast Slope

FREEZING OF A SLOPE carrying down-cast air at Germantown Colliery, Raven Run Coal Co., Germantown, Pa., a subsidiary of Jeddo-Highland Coal Co., was a problem until John Novatnak, mine superintendent, designed a folding steel door for the slope mouth that prevents wintry gales from entering the slope.

The door consists of steel plate stiffened by angles and hinged across the midline to permit folding and unfolding as the door is raised and lowered. Angle sections set in the concrete collar of the slope provide a seat for the door that helps in maintaining airtightness. Slots cut along the bottom edge of the door receive rails, pipe and rope as the door is lowered so that leakage under the door is kept to a minimum.

Operation of the door is controlled from two push-button stations, one at the slope mouth and the other in the engine house. Both activate a 1-hp motor in a small housing to the rear of the slope collar. The necessary speed reducer between the motor and rope drum was made from a salvaged automobile transmission.

Wooden doors, manually operated, were tried previously, but were often damaged by trips of cars when closed at the wrong time. Now, a red signal light in the engine room, when lighted, indicates that the door is closed, and the engineer, having a pushbutton at hand, is in a position to prevent damage to the steel door. No damage has been done since the installation of Mr. Novatnak's door at the slope opening.

Ventilation is maintained when the door is closed through well-supported openings in nearby strippings.

Shop-Made Truck Speeds Equipment Moving

SAVING TIME and hard work in moving heavy equipment by converting a turn-table mining machine truck into an equipment carrier was recalled from previous experience in a Pennsylvania mine by James Thompson, now a coal mine rating inspector of the Pennsylvania Compensation Rating and Inspection Bureau.

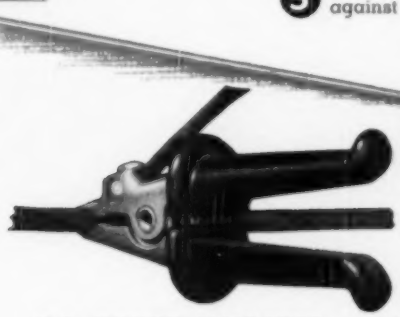
The first step in conversion of the truck was flattening the steel side boards. A sheet of $\frac{1}{8}$-in steel was welded on the truck to make a level top for easy loading or unloading from any angle. A small electric hoist, powered by a $1\frac{1}{2}$-hp motor was welded to one end of the truck, and a short trailing cable was provided to supply this hoist with power from the trolley line.

A machine roof jack was used to hold the truck in position while equipment was being loaded or unloaded from it.

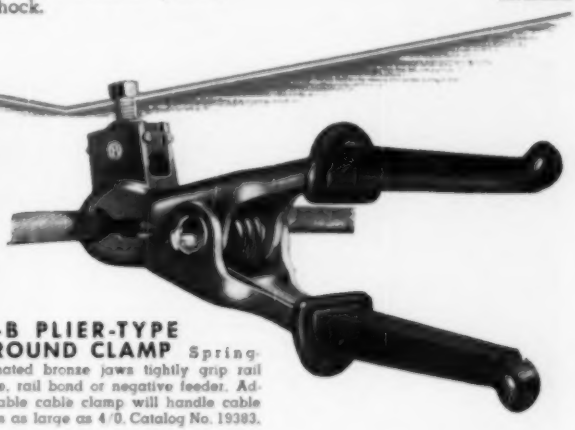
The hoist on this truck could also be used for placing mechanical units in operating position by using a jack and sheave in the room neck to permit the hoist rope to pull in the desired direction. The truck was useful in moving and placing conveyor drive units, heavy pumps and car-spotting hoists.

MAKE QUICK, POWER-TIGHT CONNECTIONS WITH O-B Ground Clamps

1. Tight mechanical connections to rail, rail bond or negative feeder prevent power leakage.
2. Full current-carrying capacity helps keep your electrical system in balance.
3. Strong clamping grip "stays put" despite cable twisting.
4. Clamps for all types of grounding —rail, rail bond and negative feeder—are easy and quick to connect.
5. Fully insulated handles protect against shock.



O-B JUNIOR PLIER-TYPE GROUND CLAMP Similar to the larger size plier-type in design, the Junior will take machine wires No. 4 and smaller. Catalog No. 19907.



O-B PLIER-TYPE GROUND CLAMP Spring-actuated bronze jaws tightly grip rail base, rail bond or negative feeder. Adjustable cable clamp will handle cable sizes as large as 4/0. Catalog No. 19383.

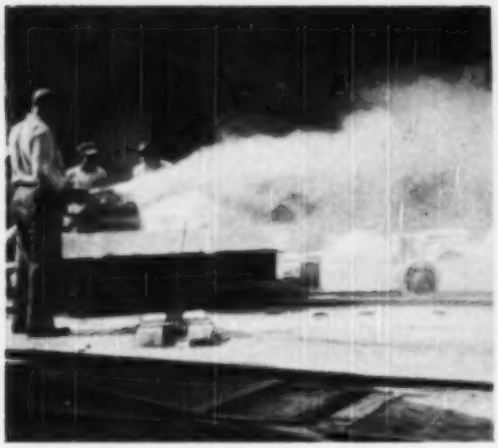
O-B BULLDOG RAIL CLAMP Using the same principle as Bulldog Clamps, this ground clamp can be attached quickly to the rail base by a twist of the rubber handle. Can handle machine cables up to No. 2. Catalog No. 16658.

O-B MINE RAIL CLAMPS This clamp fits under the rail with the jaws gripping the rail base on both sides. The handle screws tight on the threaded jaw. This clamp will take cables sizes No. 2 and smaller. Catalog No. 14627.

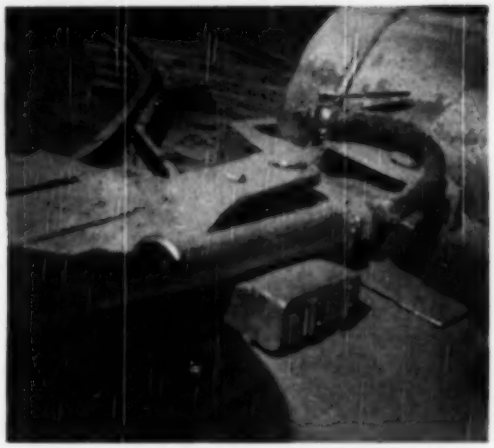
Ohio Brass

MANSFIELD, OHIO

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ont.



HOMEMADE ROCKDUSTER distributes 2,400 lb of dust per hour.



COMPRESSED AIR is carried in ½-in pipe welded into 2-in pipe.

HOPPER AND FEED LINES are securely fastened to flat car bed.

SLOT IN 2-IN PIPE and trough lining lead dust to airstream.

How To Build a Rockduster

ROCKDUSTING is a necessity at No. 40 mine, Davis Coal & Coke Co., Coketon, W. Va. However, the mine has a life expectancy of only 1 yr, so the purchase of an expensive rockduster was unwarranted. Therefore, H. B. Buckley, safety director of the company reports, mechanics in the company's shop constructed an efficient rockduster of materials available on the property. J. R. Gooding, mine foreman, and Harry Jones, federal mine inspector, designed this homemade machine.

A track-mounted air compressor provides dusting pressure, and the duster is built of the following materials: an abandoned mine flat car, 10 ft of 2-in pipe, 7 ft of ½-in pipe, 20 ft of 2-in hose, half an oil drum and a piece of flexible hose for connecting the duster to the compressor.

The 2-in pipe runs through the bottom of the half-drum, with the pipe and drum fastened to the bed of the flat car. A 5x1½-in slot is cut in the top of the pipe in the center of the drum, and the inside of the half-drum, or hopper, is lined in the form of a trough to guide rockdust to the slot. The ½-in pipe is inserted in the 2-in pipe so that the end of the smaller pipe is positioned about ⅝-in from the discharge end of the slot. This end of the ½-in pipe is cut at a 45-deg angle with the long edge up. The ½-in pipe is welded to the 2-in pipe for strength and to prevent blowback. It was tried in several different positions, before welding, to find the most effective dusting relation.

A flexible hose connection between the other end of the ½-in pipe and the air compressor permits easy detachment of the compressor for use elsewhere. The 2-in hose is connected to the discharge end of the 2-in pipe for distributing the rockdust.

This machine throws a 25-ft stream from the end of the hose under a pressure of 20 psi, with a dust-distributing capacity of 2,400 lb per hr. Estimated cost of the duster is approximately $75, including labor.

"built like a Mack Truck"

● The expression "Built Like A Mack Truck" was not coined by us. It worked its way into America's everyday language because for 50 years Mack trucks have been an accepted symbol in the public mind for something extra strong and extra rugged.

To truck users in excavating and quarry work, in pit and strip mining, in oil field hauling — "Built Like A Mack Truck" means even more. It means trucks that are built to build profits . . . designed to give advantages offered by no other make. Powerful Thermodyne and diesel engines! Massive heat-treated frames! Rubber Shock Insulators! Hydraulic Power Steering! Air Assist Clutch! Mack's matchless Balanced Bogie and Power Divider.

All are Mack advantages that assure power and brawn for the heaviest loads . . . easy handling for fast loading and unloading . . . flotation and traction for the most slippery mud or sand.

Find out what "Built Like A Mack Truck" can mean on your particular job — in greater profits through greater output . . . greater economy.

Be Profit-Wise

Modernize with

Mack

. . . outlasts them all!

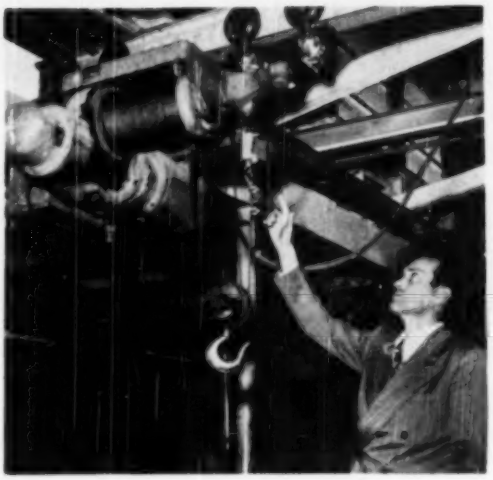
8018

Mack Trucks, Inc., Empire State Building, New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

Spring and Solenoid Provide Overload Protection for Hoists

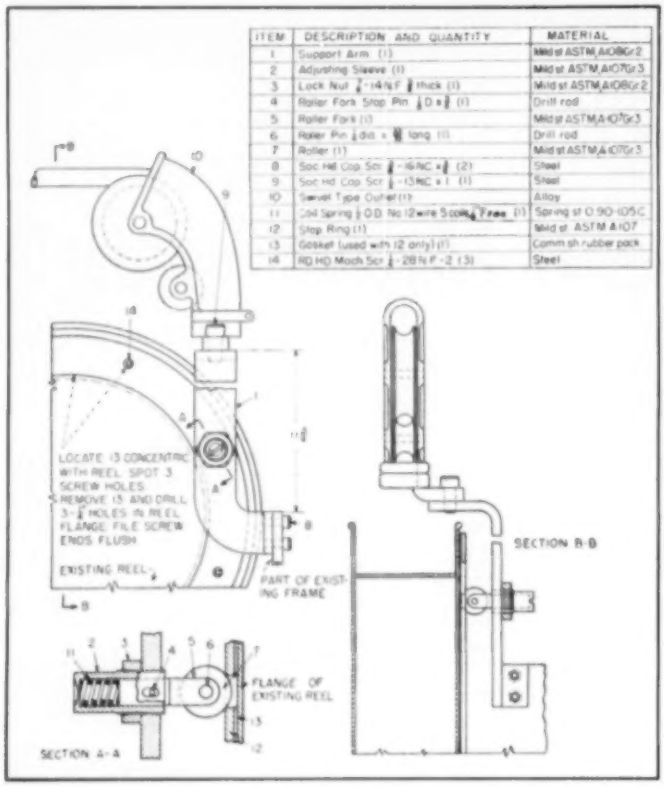
A CALIBRATED SPRING and solenoid, at Solar Aircraft's San Diego plant, provide increased safety in lifting equipment by limiting overloads to within 5% of maximum lifting capacity. These can be applied to similar equipment in mine-maintenance shops.

Developed by Tooling Superintendent Wally Marrow, the mechanism consists of a heavy-duty die spring contained in a steel housing on which a solenoid is mounted. The spring compresses when the hoist picks up a load and, as long as the load does not exceed the maximum capacity of the hoist, the electrical circuit remains closed. When the maximum load is exceeded, the spring compresses fully and actuates the solenoid which opens the circuit, stops the up travel and applies the brake. At this point the only circuit that will operate is the one controlling down travel. The safety device was designed for use on a 2-ton Shepard-Niles hoist, but hoists or cranes of greater capacities can be similarly equipped by increasing the size of the spring and calibrating it to the maximum safe load limit of the equipment.



THIS HOIST has been made much safer by installing a spring and solenoid that prevent its operation when overloaded.

Clutch on Retriever Reel Increases Safety


ITEM | DESCRIPTION AND QUANTITY | MATERIAL
1 | Support Arm (1) | Mild st ASTM A108Gr 2
2 | Adjusting Sleeve (1) | Mild st ASTM A107Gr 3
3 | Lock Nut ⅞-14 N F ⅜ thick (1) | Mild st ASTM A108Gr 2
4 | Roller Fork Stop Pin ⅜ D x ⅞ (1) | Drill rod
5 | Roller Fork (1) | Mild st ASTM A107Gr 3
6 | Roller Pin ⅜ dia. x ⅞ long (1) | Drill rod
7 | Roller (1) | Mild st ASTM A107Gr 3
8 | Soc Hd Cap Scr ⅜-16 NC x ⅞ (2) | Steel
9 | Soc Hd Cap Scr ⅜-13 NC x 1 (1) | Steel
10 | Swivel Type Outlet (1) | Alloy
11 | Coil Spring ⅜ O.D. No 12 wire Scored Free (1) | Spring st 0.90-1.05 C
12 | Stop Ring (1) | Mild st ASTM A107
13 | Gasket (used with 12 only) (1) | Comm sh rubber pack
14 | RD HD Mach Scr ¼-28 N F -2 (3) | Steel
LOCATE 13 CONCENTRIC WITH REEL. SPOT 3 SCREW HOLES. REMOVE 13 AND DRILL 3 ¼ HOLES IN REEL FLANGE. FILE SCREW ENDS FLUSH
EXISTING REEL
PART OF EXISTING FRAME
SECTION B-B
FLANGE OF EXISTING REEL
SECTION A-A

A CLUTCH ATTACHMENT, added to retriever-type cable reels, is effective in preventing accidents to shop personnel and damage to the cable and plug by placing reeling and unreeling under the control of the user, suggests Paul Ziemke, Oak Ridge, Tenn.

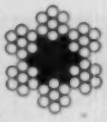
These reels are wall- or ceiling-mounted in the locomotive shop and automotive-service station, and the cable is pulled out to supply power to portable electric tools around the shop.

Previously, the cable remained taut under the action of the reel spring and created a hazard for the workers moving about the shop. When a job was completed, the tool was disconnected and the reel retrieved the cable. Slamming of the attachment plug against the reel resulted in frequent damage to the plug, and time and money were lost in repairing these.

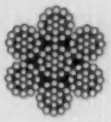
Now the clutch holds the reel in check when the required cable length has been withdrawn to reach the job, with enough excess to keep the cable on the floor. In retrieving the cable the clutch is unlocked at the reel and the user is in a position to lay the cable on the drum in neat turns and guard against damage to the plug.

DETAIL OF CLUTCH ASSEMBLY shows method of attaching stop ring, roller and swivel-type cable outlet to permit enough cable to be unreeled to do the job safely and to prevent damage to the attachment plug as the cable is retrieved by the spring-loaded reel.

Whatever the job



6x7 rope is made with 7 wires in each of 6 strands around a fiber core or a steel core. It may be bright or galvanized steel, stainless steel or monel metal. Uses are for haulage, guying, sand lines, core barrel lines, rigging, controls, etc.

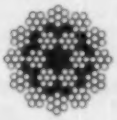


7x19 is made with 7 strands of 19 wires each, one strand forms the core. It is widely used for corrosion-resisting wire rope of galvanized steel, stainless steel and monel metal. Widely used for aircraft controls and for miscellaneous hoisting and controls.

6x19 classification is made with wire combinations varying from 16 to 26 wires in each of 6 strands. Supplied *PRE*formed or non-*PRE*-formed, Lang Lay or Regular Lay, with fiber core, or steel core in bright and galvanized steel, stainless steel and monel metal. It is one of the most widely used ropes for general hoisting, cranes, excavating equipment, haulage, mining, logging and rotary drilling. Illustrated is a cross-section of 6x19 filler with I.W.R.C.

select the right wire rope for your equipment from

6x37 group has various types with wire combinations ranging from 26 to 46 wires in each of 6 strands. Supplied *PRE*formed or non-*PRE*-formed, Lang Lay or Regular Lay, with fiber core or steel core. It is extremely flexible and has many uses for hoists, ladle cranes, coal cutting machines, winches, dredges, excavating equipment, etc. Illustrated is a cross-section of 6x41 I.W.R.C.



18x7 is made as illustrated with 18 strands of 7 wires each and supplied *PRE*formed. It is a non-rotating "Kilindo" rope made by combining two opposing lays of rope. Its principal use is for hoisting with a single line to overcome rotating or spinning of the load. It is desirable for small shop and warehouse electric hoists, and for sewer, subway and mine shaft work.

8x19 is an extra flexible rope made in various wire combinations. It is used in iron and special traction grades for passenger and freight elevator service, and in Monarch Whyte Strand Improved Plow Steel for many and varied purposes where the rope is not subjected to heavy crushing loads. Illustrated is 8x19 Seale Special Traction Elevator Rope.

A thousand and one
WIRE ROPES
made by
MACWHYTE

Putting the right wire rope on your equipment puts dollars in your pocket

Perhaps you have several uses for wire rope. Perhaps there are several types of rope you could use. But for better service, lowest operating cost, you should get a specific recommendation for each job. Tell us what equipment you have, how you use it, and the size and type of rope you are now using. Take advantage of our specialized wire rope experience with all types of equipment. Get specifications for the correct rope to use on each machine you have. Just call a Macwhyte distributor or write direct to Macwhyte Company, Service Department, Kenosha, Wisconsin.

MACWHYTE WIRE ROPE

MACWHYTE COMPANY 2931 Fourteenth Avenue, Kenosha, Wisconsin Manufacturers of Monarch Whyte Strand PREformed, Internally Lubricated Wire Rope, ATLAS Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope. Catalog on request. Mill Depots: New York • Pittsburgh • Chicago • Minneapolis Fort Worth • Portland • Seattle • San Francisco • Los Angeles

Underground Office Is Modest But Efficient

MODEST BUT EFFICIENT OFFICE for the general mine foreman is equipped with a blackboard providing ample space for listing of section foremen, notes and instructions.

UNDERGROUND OFFICES for general mine foremen range from the box-desk nail-keg-chair variety in small mines to the wainscoated version in large elaborately equipped mines. Although of modest proportions and equipment, an office that efficiently serves its fundamental purpose has been built in Bunker mine, a 4,000-ton operation of the Trotter Coal Co., Cassville, W. Va.

The office is 9x13 ft, with walls of cement blocks plastered on the inside for cleanliness and general appearance. One wall is covered with a blackboard listing names of the section foremen and their sections, along with ample space for notations and instructions regarding those sections. Mine prints, rolled and held by rubber bands, are stored on long nails driven slant-wise into a blackboard. A small table, two chairs and two all-service gas masks complete the office equipment. Meetings of the section foremen with the general mine foreman and superintendent before and after shifts are held in the mine office located on the surface close to the tipple and slope portal.

TUBULAR BIT BOXES replacing former rectangular type have a screw-on lid to prevent bit loss and are numbered for recording use by specific sections.

Round Bit Box Insures Better Service Than Rectangular Type

TUBULAR BIT BOXES used in Bunker mine of the Trotter Coal Co., Cassville, W. Va., have large and convenient handles welded to screw-on lids and have numerals welded to the sides so that the quantities of sharpened bits can be charged to specific section foremen and the exact number they return credited to them.

The box is made from a 12-in section of 6-in pipe. The ¾-in fastening bolt is welded to the bottom plate and has threads at the top end. Capacity of the box is 85 standard bits.

With the rectangular boxes formerly used, the hinged lids often came open or the boxes became bent so that the lids did not fit properly and bits were permitted to fall out.

A 3c Stamp Will Do It!

WHY HOLD BACK ON SENDING COAL AGE that good "Operating Idea." You need only write it in a letter in your own words, and the postman will do the rest. It makes no difference whether it's a mining, electrical, maintenance or safety "gadget" or idea—just as long as one way or another it helps mine or prepare coal better. Send us photos if you have them, or a drawing if needed, but remember it's the idea that counts and we'll do any editing that's necessary. COAL AGE will gladly pay you $5 or more for each acceptable idea, on publication. Write: The Editor, COAL AGE, 330 W. 42nd St., New York 18.

(Partial view of the enormous new lubricating oil plant at Lake Charles, La., where this great new oil is processed.)

"ANTI-FOULING" OIL made by the Remarkable new "HEART-CUT" PROCESS

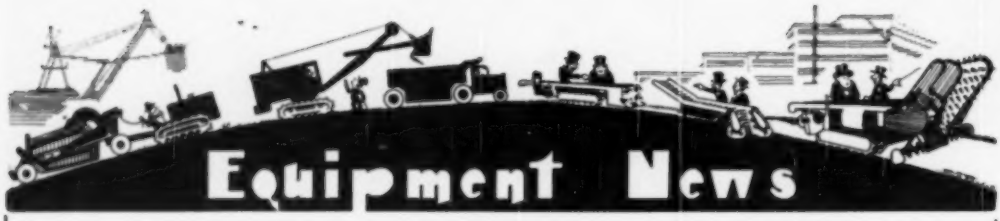
This new oil—the best known to science... gives you a cleaner engine...more economy ...minimum carbon residue.

It's here now! The remarkable motor oil from the giant new $42,000,000 lubricating oil plant at Lake Charles, La. The plant that's been the big talk of the oil industry for months.

New Premium Koolmotor is made by the unique "Heart-Cut" Process which retains only the choicest part of the finest crudes. *It's so superior that in recent engine tests it outscored nine other major premium motor oils.* No wonder Premium Koolmotor is better in every way! Cleans better, seals better, cools better and fights acid, sludge and corrosion far more effectively. Switch to this remarkable new oil today.

start saving Dollars today...stop at

CITIES SERVICE



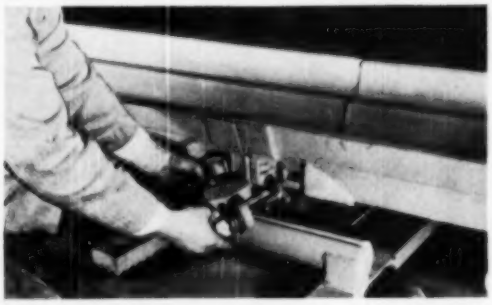
Equipment News

New Equipment for Better Mining and Preparation

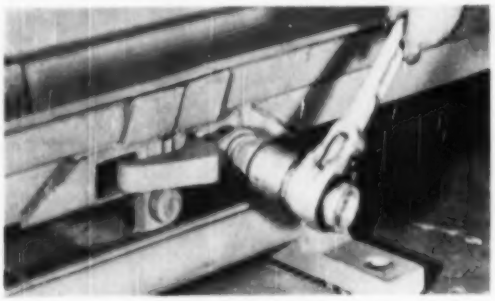
Air Compressor	Centrifugal Dryer	Fire-fighting Unit	Power Units	Truck Loader
Belt Conveyor	Coupling	Flight Conveyors	Shaker Troughing	Water Clarifier
Bit Attachment	Dust Collector	Hammer Drill	Storage Battery	EQUIPMENT SHORTS
Bulldozer	Electrical Control	Pinch Valve	Truck Line	AND PUBLICATIONS

Speedy Installation Possible With New-Type Troughing Connectors

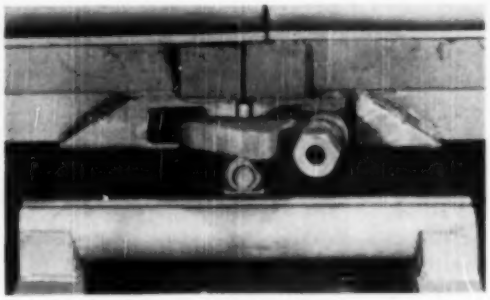
1 DOWELS on new-type trough castings slip through guide-frame eyes into receiving sockets to be held by . . .



2 CLAMPS that hook into one casting and are held in the other by a T bolt that is tightened with . . .



3 THREE or four turns of the nut that draw up and clamp the two troughs together to provide an . . .



4 END-TO-END connection that offers high strength, less breakage and smoother operation.

Shaker Troughs Feature New Design and Connectors

DESIGNED TO OFFER longer service and smoother operation, plus greater ease and speed of assembly, a new-type Goodman shaker-conveyor troughing and connectors, known as "Column-Type Troughing," incorporates newly designed connectors that are expected to eliminate breakage of connecting eyes while providing a strong but sufficiently flexible trough line. With the new-type connectors, the entire operation of assembling two troughs requires only 15 sec, according to the manufacturer. Featuring a multiple-construction frame with a welded trough plate that may be renewed when worn, the new troughing is installed end-to-end, with no overlapping edges, to give the effect of one continuous line from face to discharge point.

The frame for the new troughing consists of two side angles connected on the ends by cross straps formed to the contours of the trough and has a trough plate of conventional shape welded to it. Each of the four corners of the frame is equipped with flanged-type connecting castings, one pair of male castings having dowel pins and the female pair having sockets.

To assemble the troughs, the dowels are slipped through eyes in the con-

Where Service Life Counts Most

COMMERCIAL FUEL CO. USES J&L WIRE ROPE

J&L STEEL

Marion 5560 with a 32-yard bucket (above) and (right) Bucyrus-Erie 500-W dragline moving overburden for Commercial Fuel Company. These machines uncover more than one million tons of coal per year—use J&L Wire Rope to cut costs.

J&L Hoist Ropes and Draglines Pay Off in Cubic Yard Mileage on Big Equipment

Commercial Fuel Company knows that strip mine profits really take a beating when a 32-cubic-yard shovel bucket and a twelve-yard dragline have to stop moving overburden because of a breakdown. That's why Commercial Fuel Co. cuts downtime to a minimum by using J&L hoist ropes on its huge Marion 5560 Shovel and J&L draglines on its Bucyrus-Erie 500W.

Stripping two pits near Cumberland, Ohio, these two machines remove an average of 50 feet of overburden from the more than a million tons of coal that Commercial Fuel Co. mines each year. Operating on a schedule such as this, big equipment has to produce and *keep on producing*—or loading, hauling equipment and men are forced into costly idleness.

Commercial Fuel Co. knows how to keep its equipment producing. Records show that J&L Wire Rope can be counted on for *extra* economy through longer service life—less equipment downtime. Long life is a built-in feature of J&L wire rope.

Quality is controlled by J&L in every step of manufacture from the mining of the ore through the final stranding and closing operations.

ATTENTION
MANUFACTURERS · OPERATORS

If you build or operate shovels, draglines, scrapers, or any other type of equipment where wire rope is important to economy and efficiency of operation, contact J&L for information regarding the specific design of wire rope that will do the best job for you.

Jones & Laughlin Steel Corporation
411 Jones & Laughlin Building
Pittsburgh 30, Pennsylvania

I am interested in using the right wire rope for the job. Please send me a free copy of your handbook "Wire Rope in a Machine."

NAME _____

COMPANY _____

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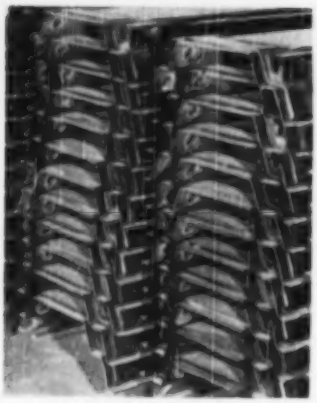
JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY *and* JALLOY *(hi-tensile steels).*

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS



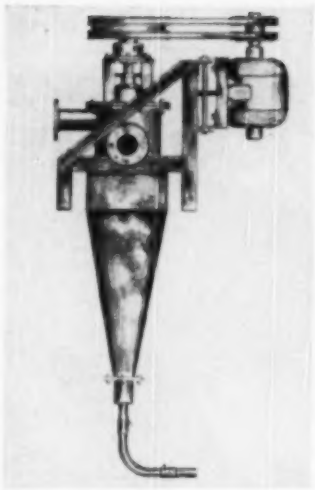
ELIMINATION of connecting eyes permits stacking troughs inside one another, for savings in storage area required.

necting lugs of the supporting guide frame into the sockets. Clamps equipped with T bolts at one end are hooked into recesses in the female castings, with the T bolts inserted in the slotted recesses on the male ends. Three or four turns of the nut on the T bolt draws up and firmly clamps the two troughs together. A spring on the bolt keeps it under tension and reduces any tendency to loosen in operation.

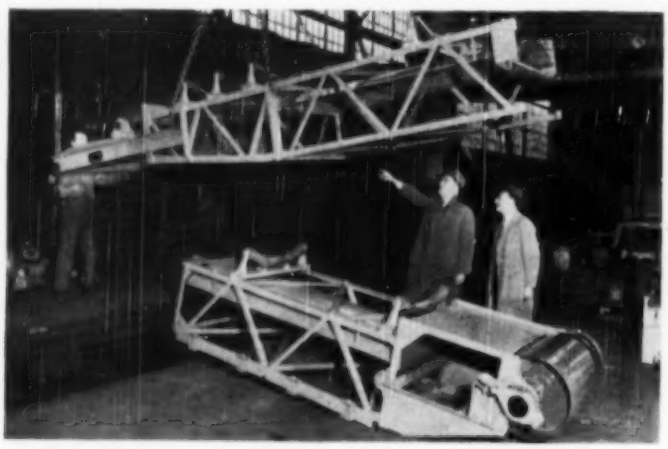
Frame design and construction are said by the manufacturer to provide the strength necessary to withstand the impact of falling roof, etc., and almost any amount of rough handling, without any appreciable increase in weight of the troughs necessary. When connected, the longitudinal strength of each trough reduces stretch or whip in the line, thus lessening the load on the drive and utilizing full drive power, it is said.

In addition, the small area of contact between the troughs maintains enough rigidity to resist bucking, yet permits sufficient flexibility for operation over uneven bottom without damage to the clamps or the parts of the troughs to which they are fastened, the company says. Since the connecting mechanism is fastened to the trough ends near the neutral axis and the center of gravity, bending action on the clamps is negligible. A tight connection and smooth operation are maintained even when the conveyor line is curved, where necessary, by installing ¼-in washers between the dowel pins and the connection to the trough supports, it is reported.

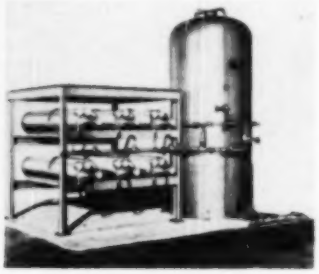
A minimum of storage space is another feature cited for the troughs, since there are no connecting eyes and the troughs can be stacked one inside the other without the danger of an unsteady pile. With a stack of 12 troughs standing only about 40½ in high, only a small area is needed to store those required for a complete room.



WATER CLARIFIER — Prins "Streamcleaner" is a new centrifugal coal-slurry thickener for clarification of coal-washery water and is said to remove excessive fines, discharging them in concentrated form for disposition either as fuel or refuse. The unit operates automatically and the fluctuation of the percentage of fines in the water do affect the consistency of the discharged solids, the manufacturer states. Available in 8-, 12- and 16-in diameters, the units are rated at 100, 200 and 300 gpm, respectively. Low installation costs and minimum space requirements are additional features cited by the manufacturer.—*K. Prins & Associates, Wellston, Ohio.*



BELT CONVEYOR—New Hewitt-Robins Sectional Conveyor designed for easy assembly in the field without special technicians consists of a head section, a tail section and any desired number of intermediate truss sections to form a conveyor of any length up to limitations of the belt. Made in widths of 18, 24, 30 and 36 in, the truss sections are 6½, 15½, 18½ and 21½ ft long by 24 in deep and also 24 ft long by 42 in deep. A transition section to permit using both depths on a single conveyor and bent supports for setting the conveyor on a grade also are available. A protective decking of 16-gage curved plate separates the carrying and return belts. Two types of take-up are available: a protected screw-type for conveyors up to 200 ft long and a vertical-gravity type for longer units. Bulletin 132 available.—*Robins Conveyors Div., Hewitt-Robins, Inc., Passaic, N. J.*



STATIONARY FIRE-FIGHTING UNITS available in 500-lb, 1,000-lb and 2,000-lb capacities are designed to protect wide areas where a minimum of manpower is available and can be readily operated by one man. The unit consists of a centrally located steel tank containing dry chemical in nitrogen cylinders used to pressurize the tank, with piping running underground from the tank to one or more hose houses having 1-in hose, available in 50, 100 and 150-ft lengths. Rate of flow is 450 lb per min and effective range is about 35 ft.—*Ansul Chemical Co., Marinette, Wis.*

For shovel hoist and dragline in strip mining, Roebling Preformed "Blue Center" Wire Rope, Lang Lay, with an Independent Wire Rope Core is a must. . . . For mining machines, the same rope in Regular Lay is your one best choice.

Preformed that lasts longer and saves money!... that's why

Today it's Roebling!

YOU WANT ROPE that's *extra* tough, *extra* strong, *extra* long-lived! And you *get* these extras in Roebling Preformed "Blue Center" Wire Rope, for "Blue Center" steel has completely superior resistance to abrasion, shock and fatigue. Roebling developed and is the only maker of "Blue Center" steel . . . and Roebling research, workmanship and modern, precision machines are your added assurance of rope quality that pays off.

But for everything wire rope can give, be sure to get Preformed. Roebling Preforming makes rope easier to handle and install. It can be cut without seizing. It spools better . . . is not inclined to set or kink . . . minimizes vibration and whipping.

There's a Roebling wire rope of the right construction, grade and size for every type and make of rope-rigged equipment. Have your Roebling Field Man tell you which rope will give the best and the lowest-cost performance for every installation. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

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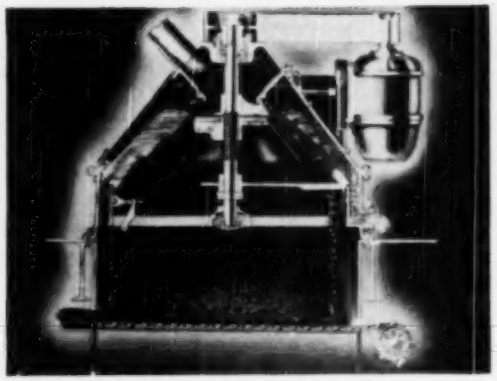
Atlanta, 934 Avon Ave. • *Boston*, 51 Sleeper St. • *Chicago*, 5525 W. Roosevelt Road • *Cincinnati*, 3253 Fredonia Ave. • *Cleveland*, 701 St. Clair Ave., N. E. • *Denver*, 4801 Jackson St. • *Houston*, 6216 Navigation Blvd. • *Los Angeles*, 216 S. Alameda St. • *New York*, 19 Rector St. • *Philadelphia*, 12 S. Twelfth St. • *Portland*, 1032 N. W. 14th Ave. • *San Francisco*, 1740 Seventeenth St. • *Seattle*, 900 First Ave. S.

NEW-TYPE STORAGE BATTERY—New Yardeny Silvercel akaline storage battery utilizing silver and zinc as active materials is reported to be one-half the size and three to five times lighter than average batteries of the same capacities. Now available in five models from 0.5- to 40-amp-hr capacity, with others in the development stage, Silvercels offer these features, according to the manufacturer: an amp-hr efficiency approaching 100% and an energy efficiency of about 85%; leakproof construction, without discharge of corrosive fumes, vapors or sprays; resistance to shock; and ability to withstand high discharge rates without damage. Bulletin available.—*Yardney Electric Corp., 105 Chambers St., New York 7.*

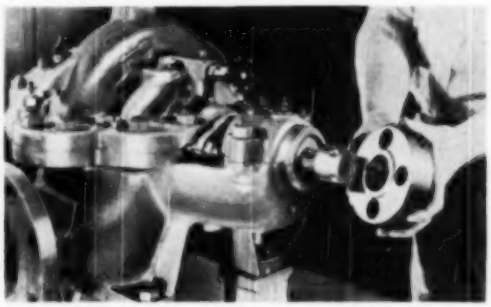
POWER UNITS—Complete new line of Ford industrial power units include five models available in either open or enclosed versions, complete with radiator, instrument panel and S.A.E. or Ford-type housings and equipped with skid-type mountings. The units may be ordered with or without clutch, power take-off and 3-, 4- or 5-speed transmissions. Thoroughly tested in manufacturing and ready to run immediately upon installation, the industrial engine power unit line includes two six-cylinder models, two V-type eight-cylinder models and one of four cylinders.—*Ford Motor Co., Dearborn, Mich.*



CENTRIFUGAL DRYER—New-model McNally-Carpenter centrifugal fine-coal dryer for handling wet coals up to ⅜x0 is said by the manufacturer to offer a considerable saving in maintenance time and costs with the addition of quickly removable screen and wear plates. Screens are now held in place with clamps and set screws and wearing plates with dogs, eliminating bolts formerly used. Bulletin 1149 available.—*McNally-Pittsburg Mfg. Co., Pittsburg, Kan.*

DUST COLLECTOR—New Sly Dynaclone dust filter is designed to utilize frequent blasts of reverse air to keep cloth bags free of dust and offers three operating advantages as cited by the manufacturer: (1) No shutting down of operation to remove accumulated dust from the bags; (2) longer bag life through elimination of shaking or flexing; (3) and no gradual loss of efficiency from the building up of a dust layer on the cloth bags. The air blasts are created by the main fan of the dust-control system and require no auxiliary equipment. Operation is said to be uniform, continuous and automatic and all shaking mechanism has been eliminated. Present installations of Sly dust filters can be changed over to utilize the new Dynaclone feature, it is said.—*W. W. Sly Mfg. Co., 4700 Train Ave., Cleveland 2, Ohio.*

TRUCKS—New Dodge line of Y Model trucks with a nominal rating of 4 tons has a gross vehicle weight of 28,000 lb and a gross combination weight of 50,000 lb. The new 6-cylinder engine especially designed for the line delivers 154 hp, has a compression ratio of 6.5:1 and develops 330-lb-ft gross torque. New twin carburetors and manifolds assure unusual fuel economy and good fuel distribution, with twin exhaust systems cutting down back pressure and boosting engine efficiency, the company says. The new trucks are offered in 30 basic models.—*Dodge Div., Chrysler Corp., Detroit 31, Mich.*



COUPLING—New Allis-Chalmers "Magic Grip" coupling, said to be simply constructed and easy to install or remove from the shaft of pumps or motors, is interchangeable with the previous standard coupling. It is available in two bore sizes, ⅝ and 2⅛ in, both taking up to 120 hp at 3,550 rpm, and other sizes are to be available later. An adaptation of the Magic-Grip sheave principle, the new coupling consists primarily of two cast-iron discs with tapered bores, rubber-covered tubes assembled on studs, split tapered bushings and two set screws for each disc.—*Allis-Chalmers Mfg. Co., Milwaukee, Wis.*

Operator Russell Yeany says, "The TD-24 can't be beat; easy to control, easy on the operator. I wouldn't have any other tractor, now."

When stripping means ripping away rocks to get at the pay, the New International TD-24 is the choice of cost-conscious strip miners. This "Champion of Crawlers" puts twenty tons of toughness to work *twenty-four* hours a day in a Hawthorne, Pa., strip mine. Teamed up with another TD-24 and an International TD-18, the big "Champion" pushes five yards of shale at a time, according to its operator. The tractors work 'round the clock, taking time out only for lubrication. Six months of this rugged life has not slowed up the mighty "Champion." Only ordinary maintenance has been necessary.

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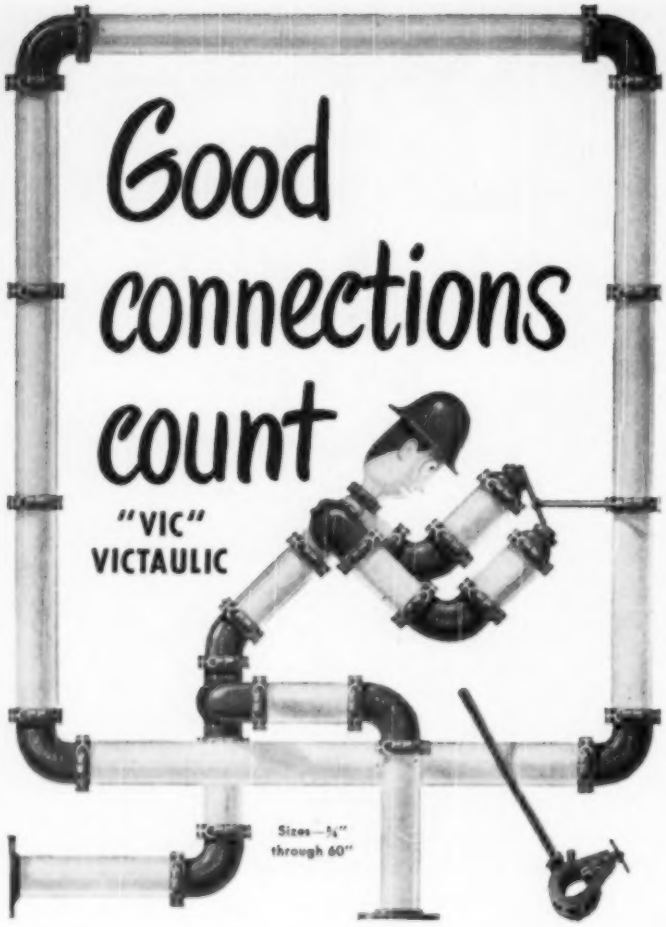

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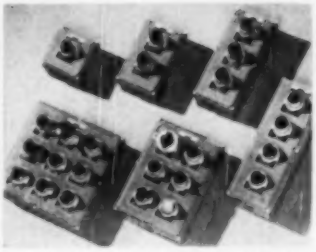
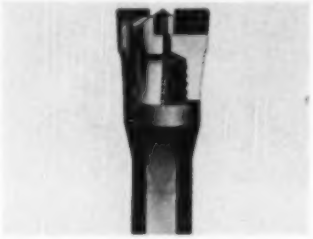


ELECTRIC CONTROL STATIONS—New line of Westinghouse Oil-Tite control stations and units is especially designed for machine-tool control and other heavy-duty installations in any desired combinations in the stations and features a durable resilient gasket that provides a never-failing seal against oil, coolant, cutting compound and water. Units and nameplates can be rotated 90, 180 or 270 deg to permit mounting in any position, and terminals on the contact block are reversible for front and rear connections. Five types of operators, with matching pilot lights, offer unit flexibility and a wide variety of contact arrangements is available for complex applications. Operating heads and contact blocks are both interchangeable.—*Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.*



DRILL-BIT ATTACHMENT—Designed primarily for use with tungsten-carbide bits, new attachment offers long life and dependable performance and is said to permit users to realize full drilling economies possible with Ingersoll-Rand Carset Jackbits. The attachment is of the shoulder type employing a patented 38-deg reverse-buttress thread and was developed particularly to resist shock and impact while still preventing slippage, excessive thread wear or loss of drilling speed. Four sizes are available, for bit gage sizes from 1⅝ to 3 in.—*Ingersoll-Rand Co., 11 Broadway, New York 4.*

NEW MOLYBDENUM LUBRICANT, for lubricating high-speed, high-temperature, high-pressure bearings, "plates" on friction surfaces to form a permanent protective film, it is reported. "Liqui-Moly" is also useful as a pipe-fitting compound to insure quick disassembly regardless of age, heat or corrosion, according to the manufacturer. Available for ex-

This plant is successfully washing a very difficult seam of coal for the metallurgical markets with the Chance Process and Deister Super Duty Tables.

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FIRST BIG POST-WAR DEVELOPMENT IN UNDERGROUND COAL BELTS

New 4-ply U. S. Giant Underground Coal Belt has rugged strength without sacrificing high flexibility

Now for the first time coal mine mechanization has a 4-ply belt with all the ruggedness and fastener-holding ability of United States Rubber Company's 4-ply 42 oz., with *increased crosswise flexibility*. Now for the first time all the desirable features of an underground belt are incorporated in *one* type of construction.

Style XN has a working tension strong enough to satisfy the requirements of all but a few of today's installations. Style YN incorporates the additional strength required by extremely long center installations in use or contemplated.

Outstanding features of this remarkable belting include: OPTIMUM CROSSWISE FLEXIBILITY, providing excellent troughing and easy training, eliminating edge wear and spillage. CROSSWISE STRENGTH, to resist gouging and tearing. ONE-TYPE FABRIC CONSTRUCTION, to equalize tension and elongation throughout the belt. ELASTICITY, to cushion shock loads and impact, prevent localized strain. FASTENER HOLDING STRENGTH comparable to United States Rubber Company's 4-ply 42 oz., which hitherto has been considered outstanding in this respect.

For more information write Mechanical Goods Division, United States Rubber Company, Rockefeller Center, New York 20, N. Y.

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perimental purposes at $2.00 per lb.—*Lockrey Co., College Point 1, N. Y.*.

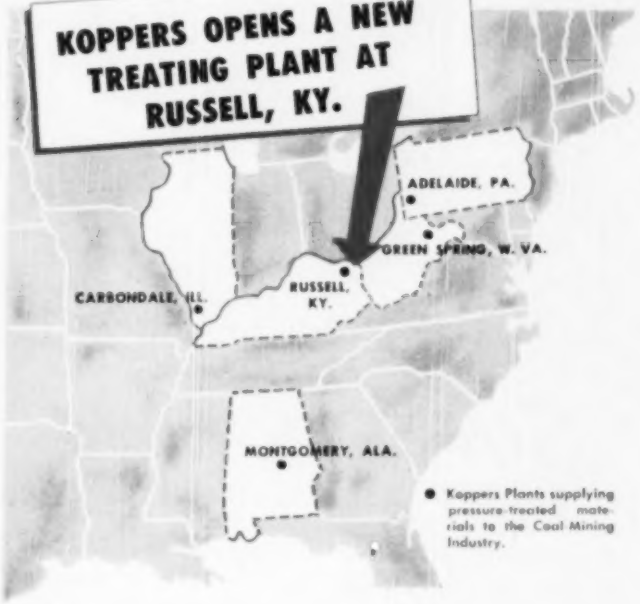
HYDROBLENDER "wets" water at point of use for controlling coal dust at a cost of 1c per ton of coal treated, according to the manufacturer. Chemical capsules placed in the lucite tube dissolve in proper proportion to the water passing through a built-in venturi nozzle. Each capsule makes a minimum of 1,000 gal of "wet water." The unit operates at pressures between 25 and 100 psi, with most efficient spraying at 60 to 75 psi. Special tanks and piping for preparation and storage of solution are not required. Bulletin available.—*Aquadyne Corp., 220 East 42nd St., New York 17.*

GASOLINE HAMMER DRILL—New self-rotating hole-cleaning gasoline hammer drill utilizes a single-cylinder gasoline engine driving two pistons, one actuating the flywheel magneto and cooling fan and the other striking directly on the drill shank, with rotation of the drill steel and bit accomplished with spirally splined piston and ratchet. Exhaust gas forced through the hollow drill steel blows the cuttings out of the hole down to approximately 24 in and for drilling down to 8 or 10 ft, a small auxiliary gas-engine-driven blower is connected by hose. The unit uses standard 1x4¼-in-shank hollow drill steels and detachable carbide-tipped drill bits from 1½ to 2 in in diameter.—*Syntron Co., 975 Lexington Ave., Homer City, Pa.*

Part of present stock of mine ties at Russell Plant

For even better service to the industry . . .

KOPPERS OPENS A NEW TREATING PLANT AT RUSSELL, KY.



THE new Koppers Plant at Russell, Kentucky, is now completely equipped and stocked with materials to serve the coal-mining industry. Pressure-creosoted mine ties, timbers, poles and posts can now be delivered promptly in this West Virginia-Kentucky area.

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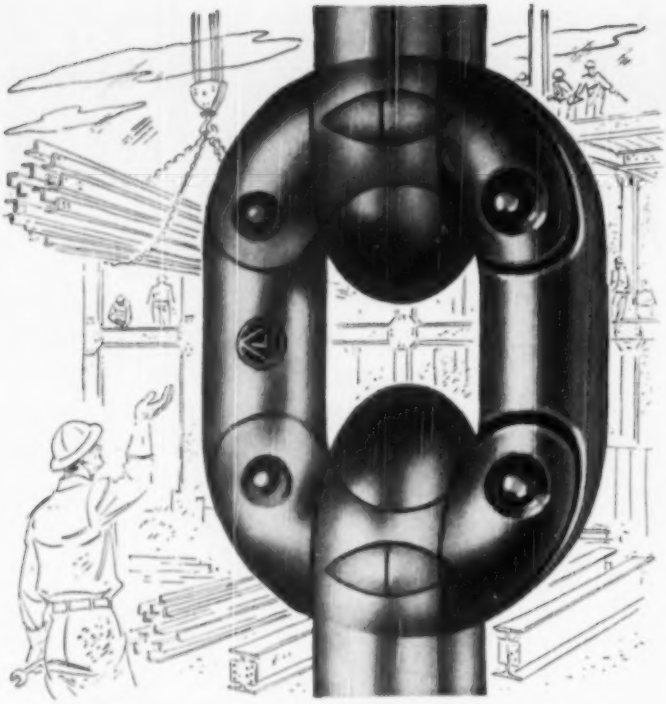

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The Laughlin "MISSING LINK"* with Interlocking Safety Lugs is stronger than the chain itself!

Replace worn or broken links in any proof coil chain with Laughlin "Missing Links" — and your chain is stronger than it ever was before! That's because the perfectly matched halves put the load on the interlocking lugs with no strain on the rivets. You get this *extra* security at worthwhile savings in time and money, too, because "Missing Links" go on in a jiffy, much quicker and cheaper than welding. Made of drop-forged, heat-treated steel, super-strong "Missing Links" are available in all sizes from 3/16" to 1¾" at your distributor's. Write for Laughlin Catalog #145, industry's data book of fittings . . . THE THOMAS LAUGHLIN COMPANY, DEPT. 6, PORTLAND 6, MAINE.

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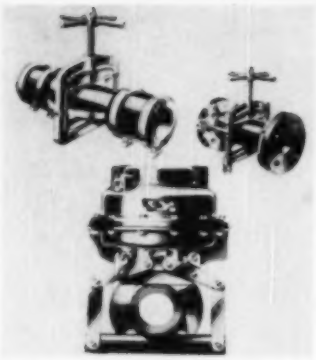

PINCH VALVES — New line of pinch-type Flex Valves for controlling the flow of many highly abrasive and corrosive materials, includes the Slip-On Type 7100 in sizes ½ to 2½ in for mounting over pipe ends; Flanged-End Type 7200 in sizes 1 to 12 in; and the Diaphragm Motor Type 7300 in sizes 1 to 10 in. Features cited by the manufacturer for the Flex-Valve body include elimination of internal parts or obstructions, freedom from water hammer, an 11 to 1 life for abrasive over metal valves, full pipe capacity, absolute bubble tightness, simple installation and a smooth bore that minimizes incrustation. Construction features a basic rubber tube available in various compounds, and covered with a specially impregnated cloth followed by layers of pure gum. Wrapped in acid-resistant covering, with flanges built on during wrapping, the entire unit is vulcanized and cured in ovens, blending the wrappers and the inner layers into one flexible and moving wall that is said to meet severe abrasive and corrosive requirements. Bulletin 455 available. — *Flexible Valve Corp., Palisades Park, N. J.*

NEW TRUCK LOADER, for use in storage yards, combines road speed of 15 mph and truck-type worm and roller steering for fast and easy maneuvering between scattered stockpiles. Discharge boom and loading conveyor are hydraulic-powered for flexibility in gathering material and trimming the load on truck. Design of the Model 543 bucket loader permits loading of large trucks at the rate of 3 cu yd per min with a minimum of spotting effort. The machine requires an overhead clearance of only 12 ft. Two forward and two reverse speeds permit operator to select power output to

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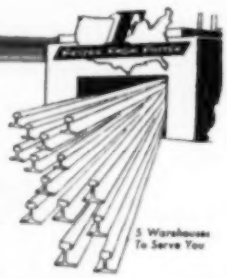

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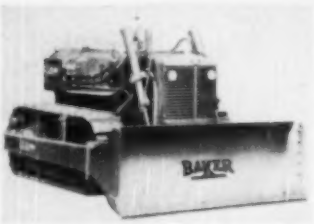
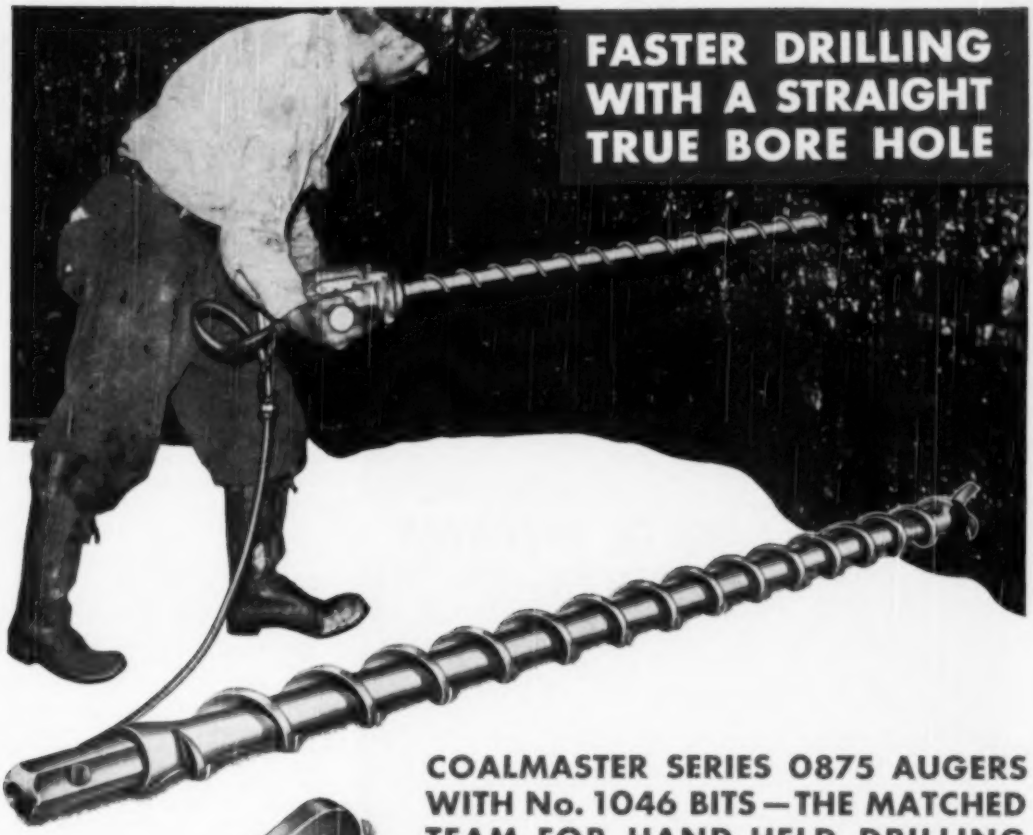
suit material being handled.—*Barber Greene Co., Aurora, Ill.*



BULLDOZERS—Complete new line of Baker Bulldozers and gradebuilders for Allis-Chalmers HD-5 tractors are controlled through twin hydraulic cylinders mounted at the front of the engine frame. Other features cited by the manufacturer include: overhead height of the mounting less than for the tractor itself; direct lift with a minimum of working and wearing parts; positive down-pressure; sensitive finger-tip control; servicing of tractor engine without removal of bulldozer; rolling-action blade shape; and conversion from bulldozer to angling gradebuilder with a minimum investment. Both units are available for standard and wide-gage A-C HD-5 tractors. Catalog Available.—*Baker Mfg. Co., Springfield, Ill.*

MOBILE FLIGHT CONVEYORS—Newly expanded line of rubber-tired mobile flight conveyors includes nine new models, with flight widths up to 24 in. and the flight height to 6 in. Features cited by the manufacturer include all-welded structural and sheet-steel construction, and steel flights pulled by two strands of conveyor chain that is guided on both the loaded and return levels to maintain proper alignment. The units offer a full range of chain speeds and variable speed control and are available for electric, gasoline or diesel power. Bulletins 940 and 941 available.—*Bonded Scale & Machine Co., Columbus 7, Ohio.*

AIR COMPRESSOR—New 60-cfm compressor said to be lighter in weight, more economical in operation and lower in cost is a 3-cylinder air-cooled unit known as the Davey Super Chief Model 60-WBD. Among the features cited by the manufacturer are: stainless-steel "Permanent-Peak-Efficiency" valves guaranteed not



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COALMASTER SERIES 0875 AUGERS WITH No. 1046 BITS—THE MATCHED TEAM FOR HAND-HELD DRILLING

The long-life bits with scientifically ground-and-super-hardened cutting edges are precisely matched to the Coalmaster Spir-L-Weld auger flights for a uniform bore-hole. Available with or without detachable heads.

Perfect alignment of these Coalmaster Matched Sets assure rigid position without "whipping" and "chattering". The bore hole is made true and round for tightest tamping and better shooting.

Coalmaster Bits and Augers cut maintenance and replacement cost too. Write for the new Coalmaster Catalog.

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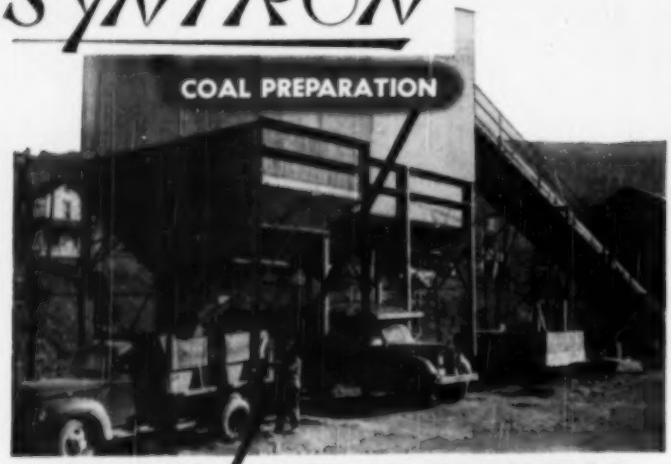
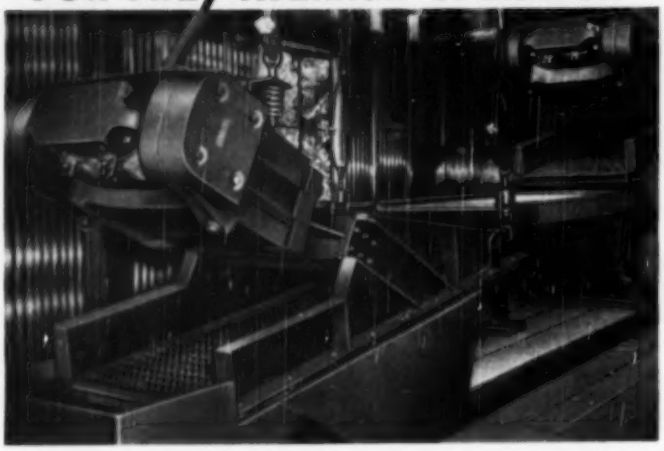


FOR THE AVERAGE OPERATOR



HERE'S HOW—AT AMAZINGLY LOW COST—another coal operator successfully met market requirements for a prepared product by applying Syntron dual-purpose Screens, Picking Table and Vibrators—all equipped with rheostat control to provide for instant change to correspond with changes in the feed and for selecting the rate of flow. The first "Vibrating" Screen bypasses the fines into No. 1 bin and feeds the overproduct onto the "Vibra-Flow" Picking Table. The latter, flowing the coal smoothly and evenly forward for most efficient hand removal of stone, slate, bony, etc., feeds onto the second "Vibrating" Screen which classifies the coal into undersize and oversize products. Storage bins of both the raw coal and the finished products are kept free-flowing with "Pulsating" Vibrators.

ELECTRIC VIBRATORS | VIBRATING GRIZZLIES | VIBRATING SCREENS

VIBRA-FLOW PICKING TABLES | VIBRA-FLOW FEEDERS

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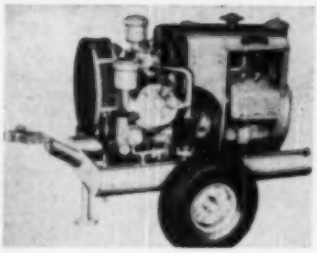


to carbon; an automatic centrifugal clutch that engages at 700 rpm; full-force-feed lubrication; replaceable-element air and oil filters; and a built-in unloader system automatically maintaining any predetermined air pressure up to 100 lb.—*Davey Compressor Co., Kent, Ohio.*

•

Equipment Shorts

FLASH-O-GRAPH presents safety messages that move along continuously like electric news bulletins. The steel-encased unit projects the message from a perforated tape passing between the window and a fluorescent light in the case. Special messages can be furnished in addition to 52 standard messages now in stock. Bulletin available.—*Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa.*

NEW PORTABLE DEIONIZING APPARATUS is said to provide ideal water, free from harmful metallic content, for industrial batteries. Fed with ordinary tap water, the Deeminizer yields a chemically pure product, at a rate of 5 gph, that has electrical resistance values up to 10 million ohms

When This Mine Mechanized they ran into difficulties

This particular mine in West Virginia found that mechanized full seam mining reduced operating costs and speeded up production, but mechanical mining also gave them some problems in the form of oversize and refuse that passed through the crusher. This oversize and refuse blocked washer refuse gates, causing frequent plant stoppages. The owners called in Pennsylvania engineers, and after a complete analysis of the problem a 10½′ x 17′ Open Feed End Pennsylvania Roller Mounted Bradford Breaker was erected in parallel with the existing primary shaking screens, picking table and lump crushing equipment (which can be used if necessary as an alternate flow).

In approximately 15 months, due to savings made possible with the Bradford Breaker, the cost of the machine had been amortized! Not only did it eliminate oversize stoppages, but the washing plant load was reduced 12% and picking labor 80%! This operating cost reduction is only part of the story; add to it low power requirement, low maintenance and long life, and it is easy to see why more and more mines are installing Pennsylvania Bradford Breakers in cleaning plants.

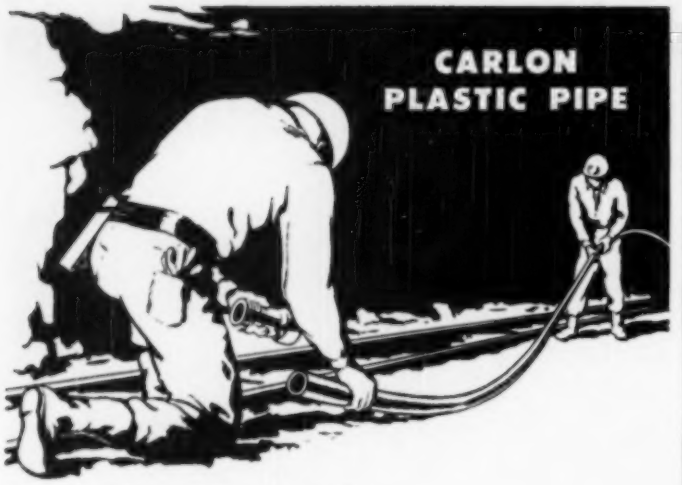
Pennsylvania Bradford Breakers crush, screen, and scavenge ROM all in one operation, automatically scooping out debris and, equally important, recovering large percentages of good coal clinging to high ash impurities. Crushing is by gravity impact, with continuous screening—passing sizes escape immediately while oversize stays trapped until shattered. Product is uniform, with minimum fines, no oversize, no large debris. Thus, cleaning plant capacity is increased; washers are protected against damage.

HERE'S THE WAY TO MAKE FULL SEAM MINING PRACTICAL AND ECONOMICAL
PENNSYLVANIA
BRADFORD BREAKER
PENNSYLVANIA CRUSHER COMPANY

USE THIS PROBLEM ANALYSIS SERVICE

For the asking you can avail yourself of the services of our laboratory and thoroughly trained Pennsylvania engineers to help you get the right answer to your coal conditioning procedure. We'll be glad to hear from you. Would you like to receive a copy of Bulletin 3007?

PENNSYLVANIA CRUSHER COMPANY, *Division of Bath Iron Works Corporation,* 1711 Liberty Trust Bldg., Philadelphia 7, Pa. New York—Boston—Pittsburgh—Birmingham — Roanoke — Detroit — Chicago — St. Louis—Crosby, Minn. — Los Angeles. *Associated with* Fraser & Chalmers Engineering Works, London.



Corrosionproof
Light Weight
Flexible...

GUARANTEES LONG CORROSION-FREE SERVICE LIFE UNDER SEVEREST MINE OPERATING CONDITIONS

■ CARLON "E" utilizes the inherent properties of plastics to solve the mining industry's pipe corrosion problems. Extruded from a specially compounded plastic, CARLON "E" pipe withstands the effects of sulphurous water . . . alkalies . . . metallic salts . . . and it has a normal service life many times that of metal piping.

■ Light weight . . . Flexibility . . . Corrosion resistance . . . These remarkable features of plastic pipe will drastically reduce your installation, maintenance, and replacement costs. CARLON "E" curves to follow shaft direction, self-adjusts to uneven surfaces, and requires a minimum number of fittings.

■ Operational tests conducted by some of the country's leading mining companies have proven conclusively that CARLON "E" plastic pipe is easier to install (at lower cost) and that its service life is far greater than that of metallic pipe.

■ Check CARLON "E" specifications. Call upon Carter's engineers or field experts to help you with mine piping problems.

Specifications of CARLUN "E" pipe

Standard Pipe Size	O. D.	I. D.	Calculated Bursting Pressure P. S. I.	Weight/ Ft.	Normal Shipping Lengths
1/2"	.840	.622	540 lbs.	0.10 lbs.	400 ft. coils
3/4"	1.050	.824	350 lbs.	0.14 lbs.	400 ft. coils
1"	1.310	1.070	200 lbs.	0.18 lbs.	300 ft. coils
1¼"	1.660	1.380	200 lbs.	0.27 lbs.	300 ft. coils
1½"	1.900	1.610	200 lbs.	0.32 lbs.	250 ft. coils
2"	2.378	2.070	170 lbs.	0.44 lbs.	200 ft. coils
3"	3.504	3.070	165 lbs.	0.91 lbs.	100 ft. coils
4"	4.504	4.030	150 lbs.	1.25 lbs.	25 ft. Str.
6"	6.630	6.070	115 lbs.	2.23 lbs.	25 ft. Str.

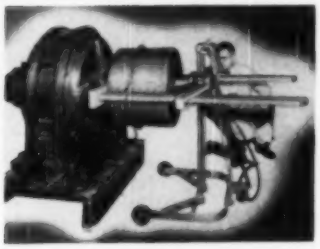
CARLON CP *Manufacturers of Extruded Plastics*

CARTER PRODUCTS CORPORATION

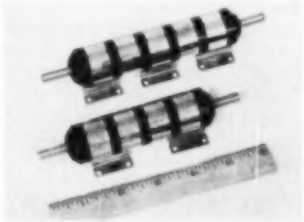
10223 MEECH AVENUE **CLEVELAND 5, OHIO**

per centimeter. Glass fiber filters remove physical impurities and a bed of ion exchange resins retain the ionized metallic content that has a destructive effect on battery plates. Conductivity meter instantly registers the quality of water being produced.—*Crystal Research Laboratories, Inc., Hartford, Conn.*

NEW 21-PLATE COLD STARTING AUTOMOTIVE BATTERY is said to have high recuperative ability and longer life with twice the starting power of average battery. Rebat 2H Battery has started heavy motorized equipment at temperatures of minus 40 deg, according to the manufacturer. —*Reading Batteries, Inc., Reading, Pa.*

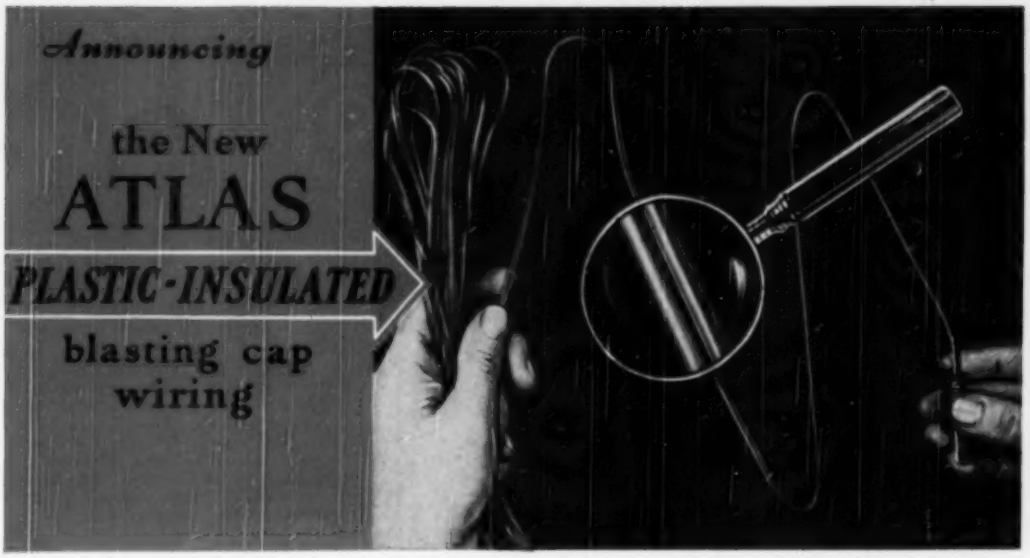


PULLEY PULLER—New heavy duty portable pulley puller, rated at 50 tons pressure, removes pulleys, wheels and gears from shafts through pressure applied by a hydraulic ram. Pressure is regulated by a 3-speed hydraulic pump. Pulleys up to 42 in in diameter and 48 in in width can be handled. — *Industrial Engineering Equipment Co.*, 122-124 *E. Fourth St., Davenport, Iowa.*



MINIATURE SPEED CHANGERS, offering gear reductions as high as 750,000:1, are built up from standard gearing sections. Input speeds as high as 50,000 rpm are permissible, and output torques up to 2 lb-in are obtainable.—*Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.*

PHOTOSENSITIZED CLOTH eliminates need for negative in reproducing engineering drawings, with savings in time and materials and distortion-free reproductions reported. The highly translucent cloth takes ink or pencil on either side, and may be handled in normal room light and exposed on conventional blueprint or



Designed for roughest field conditions... to meet the most exacting demands of blasters

Hundreds of good plastic insulating compounds were tried and rejected by Atlas Research before the new Atlas plastic-covered wire was developed. Our wire had to measure up to the most rigid demands of men who use electric blasting caps under every conceivable condition.

If you're one of our many customers who have already tried the new Atlas plastic-covered leg wires or connecting wire, you'll agree that this wire comes up to the highest expectations—and more! Here's why:

1. ***It's really tough—and truly waterproof!*** Thick plastic covering, made to withstand rough handling in jagged bore holes. Fully waterproof. Extremely high insulating value.
2. ***Less kinking and snarling!*** With minimum care, it folds or reels out without tangles or kinks—saves time and tempers in hooking up.
3. ***Flexible at 20° below zero!*** Made to withstand Arctic or Tropic weather.
4. ***Easy on eyes and hands!*** No eye-strain to see the brilliant orange or yellow wire, even in dull light. No rough edges when duplex wire is separated into single strands.
5. ***Stands up to rigid tests!*** Compare it with other wire for these outstanding properties; and also for high tensile and compression strength; resistance to deterioration from weather, rodents, vermin.

Now available in duplex on all Atlas Manasite electric blasting caps with wires 30 feet long or more. Two single plastic-covered wires on shorter lengths.

Another outstanding contribution to explosives progress by the makers of ROCKMASTER, the original split-second delay blasting system.

ROCKMASTER, MANASITE: Reg. U.S. Pat. Off.

ATLAS EXPLOSIVES *"Everything for Blasting"*

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

PLENTY OF PULL!

WITH WORLD'S LARGEST MAGNETIC PULLEY

Yes, sir, here's a magnetic pulley with *plenty* of pull! Especially designed to give complete tramp iron protection under heavy loads, this 60" diameter Electro-Magnetic pulley is installed ahead of a coal pulverizer at a large power station.

As an indication of its tremendous magnetic power — note how the 3" bolt has been pulled to the face of the pulley from nearly 2½ feet!

You may not require so large a pulley or magnetic separator to protect your machinery or purify your product, but whatever your requirements, consult STEARNS MAGNETIC — largest exclusive manufacturers of magnetic separation and transmission equipment. Write for Bulletin 303 today.

For certain light duty applications, STEARNS Permanent Magnetic Pulleys may be used. The best permanent magnetic pulleys money can buy, they require no wiring, are easily installed and eliminate operating expense. Ask for Bulletin 350-A.

Stearns

Electro and Permanent Magnetic Pulleys

Stearns MAGNETIC MANUFACTURING CO.

661 S. 28th St., Milwaukee 15, Wis.

direct-process machines. Kodak Autopositive Cloth is available in 30- and 100-ft rolls in widths of 20, 30, 36, and 42 in.—*Eastman Kodak Co., Rochester 4, N. Y.*

SPLIT WASHERS as replacements for worn-out thrust bearings slip over the shaft and lock with a safety key for quick repair. These bronze washers are supplied in any practicable size for use on heavy machines requiring thrust bearings. Literature available.—*Saginaw Bearing Co., 821 S. Water St., Saginaw, Mich.*

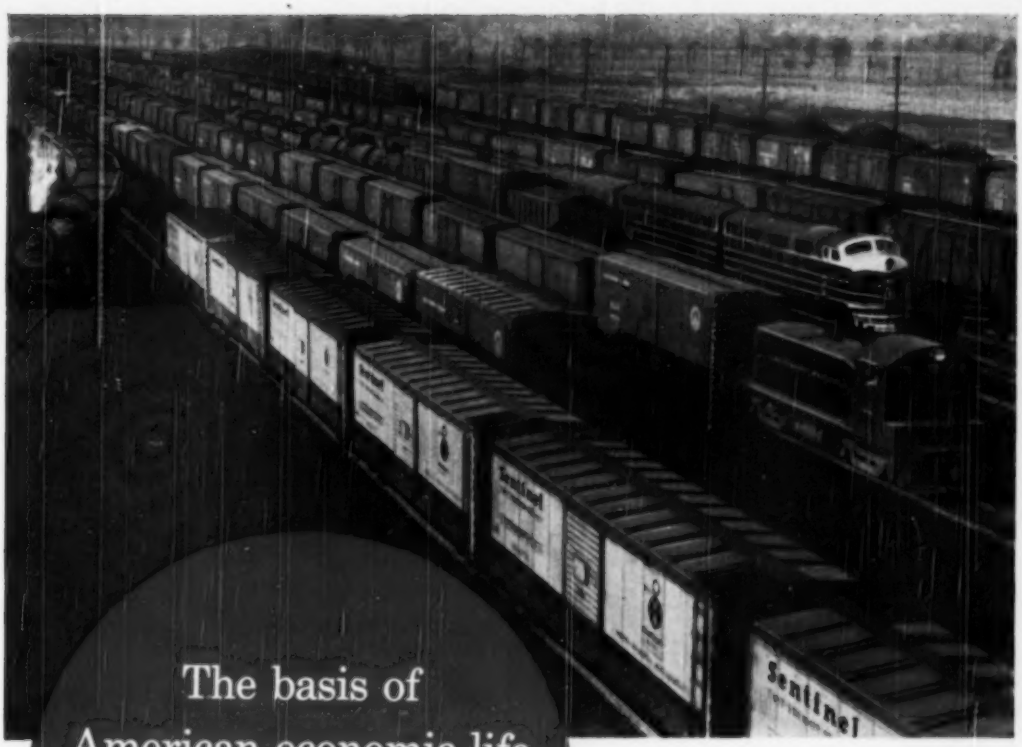
CRANE—New American Model 825 DE 25-ton "DiesElectric" locomotive crane features operation of all deck operations by diesel power direct from the engine. Travel is by electric motors mounted in each truck, with a dc traction-type generator supplying the current. Catalog 600L-8 available—*American Hoist & Derrick Co., St. Paul 1, Minn.*

CHAIN BREAKING VISE—New chain breaking vise accommodates all American Standard sizes of roller chain from ½ to 2½-in pitch in single and multiple widths. Quick adjustment for different sized chains and accurate maintenance of settings are reported.—*Morse Chain Co., 7601 Central Ave., Detroit 8, Mich.*

BUSHWACKER is a diesel-powered, 14-ton mowing machine designed for clearing heavy underbrush and small trees at a single pass. Trees up to 8 in in diameter and all undergrowth are reduced to small fragments and deposited on the ground without disturbing the topsoil. Steel flails clear a swath 6 ft wide at a rate of 1½ mph. Specifications and literature available. — *American Steel Dredge Co., Inc., Fort Wayne 1, Ind.*

NEW ANTI-CORROSIVE METAL PRIMERS for use in protecting steel storage tanks and other equipment exposed to corrosive fluids are offered by *Houghton Laboratories, Inc., Olean, N. Y.*

PARTS EXCHANGE PLAN—Old welder parts now may be traded-in on factory wound stators, armatures and certain control parts through a nationwide plan for distribution and repair. —*Lincoln Electric Co., Cleveland 1, Ohio.*



The basis of American economic life is common-carrier transportation by rail—

the only form of transportation which can and does handle anything, anywhere, anytime, in any quantity, for anyone.

For such service at its best— **Ask our man!**

BALTIMORE & OHIO RAILROAD

Constantly *doing things* —better!

LINKING 13 GREAT STATES WITH THE NATION B&O

Equipment Publications

New Bulletins Available Without Charge on Request to the Manufacturer—Arranged for Your Convenience to Permit a Quick Check of Items of Interest—Literature on New Equipment Described on Previous Pages Also Is Normally Available From the Manufacturers.

ARC-WELDING MACHINES—Air Reduction Sales Co., 60 E. 42nd St., New York 17. Catalog covering all machines in the Airco line has separate sections on ac arc welders and dc machines and includes features, operating data, specifications and other data on each.

BEARINGS—Martin-Rockwell Corp., Jamestown, N. Y. Bulletin on M-R-C fan and water-pump bearings covers applications, features and design, and includes sizes, interchangeability tables, with outline drawings showing design and dimensions.

CENTRIFUGAL AND PISTON PUMPS—Scranton Pump Div., Condenser Service & Engineerings Co., Inc., Scranton, Pa. Catalog L describes the features, application and construction of Conseco centrifugal and piston pumps and includes full data on sizes, capacities, dimensions, etc.

COAL PREPARATION EQUIPMENT—Jeffrey Mfg. Co., Columbus 16, Ohio. Catalog 815 contains illustrations and descriptions of the complete line of Jeffrey preparation equipment, including complete plant engineering, unit washeries, jigs, conveyors and auxiliary units. Design, construction and operating features of the various units are described and are illustrated with installation and cutaway photos, with size, dimensions and other details provided.

CONVEYOR IDLERS—Transall, Inc., 109 N. 11th St., Birmingham 4, Ala. Bulletin illustrates and describes Transall troughing and flat conveyor-belt idlers, with dimensions and prices.

DIESEL ENGINES—Cummins Engine Co., Inc., Columbus, Ind. Bulletin 5218C describes 88 high-speed diesels for automotive, industrial and marine applications, covering the entire power range from 80 to 550 hp, and three medium-speed diesels. Specification, performance, fuel-consumption and other data are included, along with details of construction and features. Bulletins 5285 and 5290 contain complete specifications and data for automotive and industrial models of two supercharged, 6-cylinder Cummins diesels, the 275-hp (maximum) NHS engine and the 300-hp (maximum) NHHS engine, respectively.

DIESEL ENGINES—Detroit Diesel Engine Division, General Motors Corp., Detroit 28, Mich. "GM Diesel Quiz," a pamphlet describing the features, characteristics and application of the General Motors diesel engine, is designed in a questionnaire format, and offers simple, easy-to-understand answers to 17 basic questions.

DIESEL-ENGINE Oils—Sinclair Refining Co., 630 Fifth Ave., New York. Booklet, "Diesel Engines—Fuels and Lubricants," offers a general discussion of the subject while at the same time including a more detailed technological explanation of the functions, capabilities and performance of specialized fuels, lubricants and additives for those interested. Diesel-engine construction and operation is described in detail, accompanied by application photos and cutaway views of various parts.

DRILLING TOOLS—Central Mine Equipment Co., 6200 N. Broadway, St. Louis 15, Mo. Catalog on Coalmaster drilling tools for post- and machine-mounted drills features selector tables that are completely cross-indexed to facilitate making up matched-set assemblies for horizontal and vertical drilling and covers specifications and design features of Coalmaster conveyor augers, drill bits, drill heads, wedges, drill sockets and various replacement parts and tools.

ELECTRIC CABLE—Hazard Insulated Wire Works Division, The Okonite Co., 72 Hazle St., Wilkes-Barre, Pa. Bulletin H-420 on Haxacord flexible cords and portable cables contains complete technical information and dimensional data on the entire range, from the smallest 300-v Type SJO cord to the largest 15,000-v shovel cable, including welding cables, jumpers, motor leads and mining cables. Tables of current-carrying capacities, resistance values and their correction factors, along with descriptions and diagrams of methods of splicing various portable cable constructions, are included.

ELECTRIC MOTORS—General Electric Co., Schenectady 5, N. Y. Bulletin GEA-5426 on Tri-Clad high-speed synchronous motors covers Type TS (3-phase) and Type QS (2-phase) motors in ratings from 20 to 1,500 hp at 60-cycle speeds of 1,800 rpm, as well as proportional hp ratings for speeds through 514 rpm. Included are typical applications, construction features, mechanical modifications, and direct-connected exciters for the motors.

PACKINGS—Greene, Tweed & Co., North Wales, Pa. Bulletin LP-10 on Palmetto (R) self-lubricating packings for all industrial requirements covers the principles of self-lubricating packing design, structure and performance and applications of the various types.

POWER-SHOVEL UNIT—Marion Power Shovel Co., Marion, Ohio. Three bulletins offer details on three Marion units, as follows: Bulletin 392-A for the 6½-yd Type 151-M, usable as shovel or dragline; Bulletin 394-A for the 5-yd Type 4161, usable as a shovel or dragline; and Bulletin 399 for the 3½-4-yd Type 111-M Ward Leonard Unit, usable as a shovel, dragline, clamshell, crane or loader.

RAIL AND TRACK SUPPLIES—L. B. Foster Co., Pittsburgh 30, Pa. Bulletin describing the availability of new and relaying rails and listing tables of weights and data information on track bolts, spikes, splice bars, and joints includes a new and improved all-metal 7-in "Rail Ruler." This ruler gives weight and dimensional data with full range of rail sections from 12 to 140 lb, and also full data on selected rail sections with base, ton, and head with required tons per mile.

SAFETY EQUIPMENT—General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32. Catalog, "Everything in Safety," covers respiratory devices, eye protection, hats, gloves, carboy pumps, drum pumps and miscellaneous industrial safety equipment; and includes prices.

SAFETY SWITCHES—Trumbull Electric Mfg. Co., Plainville, Conn. Bulletin TEC-19 describes operation and features of HCI (High Capacity Interrupter) safety switches, designed for use in modern high-capacity industrial distribution systems.

SCREENS—Bixby-Zimmer Engineering Co., Galesburg, Ill. Catalog on the applications and varieties of Bee-Zee Round Rod screens offers a complete description of the Bixby-Zimmer principle of Round Rod design and discusses design details of Bee-Zee screens for vibrator, shaker, conveyor, centrifugal, heat-drier, stationary, rotary, trommel and special applications.

SHOVEL-CRANE—Link-Belt Speeder Corp., Cedar Rapids, Iowa. Catalog No. 2322 contains applications, construction details, features and specifications of the new HC-51 truck-mounted shovel-crane with Speed-O-Matic hydraulic controls, a unit having a 12½-ton lifting capacity and speeds up to 37 mph.

SHUTTLE-CAR OPERATION—Gould Storage Battery Corp., Trenton, N. J. Bulletin, "A Report of Mine Shuttle Car Operation," based on 95 time studies by engineers in the Mining Division, Pennsylvania State College, gives 22 specific advantages of powering mine shuttle cars with storage batteries and discusses operating time, costs, performance and safety factors.

SPEED REDUCERS—DeLaval Steam Turbine Co., Trenton 2, N. J. Bulletin G-WB contains a complete description of standard IMO-DeLaval horizontal worm gear speed reducers, showing all available types, with standard specifications, horsepower rating tables, overhung load ratings, dimension tables and information on how to select worm gears.

SPEED REDUCERS—Falk Corp., Milwaukee 8, Wis. Bulletin 110 provides complete engineering data on Falk parallel-shaft sleeve-bearing speed reducers to simplify and speed selection, and supersedes all previous material issued on the units.

TRANSFORMERS—Allis-Chalmers Mfg. Co., 968 S. 70th St., Milwaukee, Wis. Bulletin 61B6081A, "Small Power Transformers," describes the core and coil unit, no-load tap changer, tank construction, cooling methods, oil-preserving systems, bushings, terminals compartments, indicators and testing of single-phase transformers, 69,000 v and below up to 5,000 kva, inclusive, and three-phase transformers, 69,000 v and below, up to 15,000 kva, inclusive.

TROLLEY GUARD AND MINE BRATTICE—B. F. Goodrich Co., Akron, Ohio. Catalog section on Koroseal trolley guard and Koroseal mine brattice outlines the advantages of the material for this service, including its resistance to flame, acids of mine water and atmospheric gasses, mine damp or mildew.

UNIT SUBSTATIONS—Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa. Bulletin B-4239 describing ignitron unit substations explains and describes dry-type ASL transformers, metal-enclosed switchgear for both ac and dc portions and the sealed-type ignitron rectifier equipment, along with comparisons of efficiency in operation at both low- and full-operating loads.

V-BELT DRIVES—Rockwood Mfg. Co., Inc., 1801 English Ave., Indianapolis 6, Ind. Data Book 1049 offers detailed information on Rockwood V-belt drives available, including sizes, speeds, application data, etc. One section outlines method of designing a drive and has extensive data for determining proper pulley and belt size, etc. Catalog 1149 contains sizes, specifications and prices of stock-size V-belts and sheaves carried.

WAGON DRILLS—Worthington Pump & Machinery Corp., Construction Equipment Sales Division, Holyoke, Mass. Bulletin H1200-B36A describes three models of Worthington wagon drills: UMW-40, equipped with a 4-in cylinder bore; UMW-35, equipped with a 3½-in cylinder bore; and UMW-30, with a 3-in cylinder bore. The wagon wheel base of each model is 6 ft 3 in.

users of HAZACORD REEL CABLE benefit from

HAZAPRENE ZBF * SHEATH

* ZBF ZINC BORATE FORMULA

Flame tests have shown that Zinc Borate imparts greatly increased fire-resistant properties to neoprene compounds with burning rates reduced by as much as 20% and weight losses by as much as 40%. Afterglow is materially reduced also. Millions of feet of cable protected by this type of sheath were used during the war by the Navy for special operating conditions to gain extra fire protection. Hazaprene ZBF Sheaths mean not only greater safety because of unusual flame-resistance and lack of afterglow — but also longer life through increased resistance to abrasion, wear and tear.

Tough Hazacord Reel Cable now protected with this new Hazard Sheath that provides still greater safety, economy and efficiency in electric locomotive cable service

No other mining operation proves Hazacord's *ability to "take it"* better than the outstanding *service it gives* on mine locomotives. Here, as you well know, every potential enemy of long, safe cable life is encountered continuously. And today, Hazacord Reel Cable is an even better buy with the added Hazard development — the Hazaprene ZBF Sheath.

This sheath, through mold curing, takes on the density and toughness required to prevent tears or breaks . . . has a smooth surface that slides readily over sharp edges. Yet the flexibility of Hazaprene is ample to withstand the "ins and outs" of reeling. It's compounded with neoprene, to resist oils, chemicals, acid mine water, etc. The unusual flame-resistance of Hazaprene ZBF is fully explained in box at right.

The engineering of Hazacord Reel cable includes such advantages as heat-resisting insulation that takes current surges without damaging effects . . . and conductor, insulation and sheath are firmly bonded so there's no slipping or bunching as the cable is paid out and reeled in.

Make your next reel cable Hazacord, and then compare its long, safe service with your present standards. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.

HAZARD

7343

insulated wires and cables for every mining use

Among the Manufacturers

Carl F. Norberg, vice president in charge of manufacturing since 1944, has been elected executive vice president of The Electric Storage Battery Co., Philadelphia.

James F. McCartney has been named general sales manager, Duff-Norton Mfg. Co., Pittsburgh, in charge of all industrial, mining and railroad sales of Duff-Norton jacks. Since October, 1948, Mr. McCartney has been eastern district sales manager for the company, and before joining Duff-Norton, he was eastern representative for Pressed Steel Car Co. for 7 yr.

Combustion Engineering-Superheater, Inc., New York, has appointed Carl E. Miller to the engineering staff of its industrial department. Mr. Miller was formerly technical advisor in research and development on coal, gas, and petroleum technology at Battelle Memorial Institute and served as special consultant on fuels to the ECA in Europe. During World War II, he served in the office of the chief of engineers of the War Department as chief of the heating section and assistant chief of the utilities branch.

Alfred O. Weiland has been named general manager of the Lima Works, Lima-Hamilton Corp., Lima, Ohio. During World War II, Mr. Weiland was vice president and general manager, General Machinery Ordnance Corp., Charleston, W. Va. He previously had been a partner in the George A. Houston Co.; vice president and general manager, Baldwin Southwark Division, Baldwin Locomotive Co.; and vice president and general manager, RCA-Victor.

The merger of American Air Filter Co., Inc., Louisville, Ky., manufacturer of air filters and dust collectors, and Herman Nelson Corp., Moline, Ill., producer of heating and ventilating equipment, has been reported, effective Jan. 6. The Nelson firm will be operated as the Herman Nelson Division, American Air Filter Co., Inc., and will continue to maintain its headquarters and facilities in Moline, while the merged company's principal offices and headquarters will be in Louisville. W. G. Frank, executive vice president, and Richard H. Nelson have been elected directors of the combined firm. Richard H. Nelson and Robert W. Nelson have been elected vice presidents of the enlarged firm.

Blaw-Knox Co., Pittsburgh, has formed a chemicals and fuels-synthesis department, which will deal with the conversion of fuels into chemicals, based initially on the Fischer-Tropsch synthetic-fuels process and on related processes for making synthesis gas. In this connection, Blaw-Knox has completed agreement with Ruhrchemie and Lurgi for licenses and access to all process information developed by these German firms. L. W. Alberts has been named manager of the new department. The new department will adapt processes, develop pilot plants, design equipment, provide engineering and build plants for the conversion of plentiful fuels into more valuable chemical materials and upgraded forms of hydro-carbons.

Vernon F. Daughney has joined the staff of the mineral dressing laboratory, American Cyanamid Co. as a senior mineral dressing engineer at Stamford, Conn. A graduate of the University of New Brunswick, Mr. Daughney formerly worked for several mining companies in Canada, as mill superintendent, metallurgist and consultant.

C. J. Marlett, representative for Kennametal, Inc. in the Chicago district for the past 7 yr, has been transferred to the engineering department at Latrobe, Pa., where he will be engaged in research and development on

Two Manufacturers Open Warehouse Branches

Roebling Completes New Cincinnati Facilities

NEW MODERN office and warehouse building recently opened by John A. Roebling's Sons Co. at 3253 Fredonia Ave., Cincinnati, was designed to provide unusual warehousing facilities to expedite service to Roebling agents and customers in the coal region, according to the company. W. K. Hanna, former head of the Pittsburgh office, is manager of the new branch, which will serve all of West Virginia south of Marshall County, eastern Virginia, southern Ohio and Kentucky.

Link-Belt Opens Kansas City Factory Branch

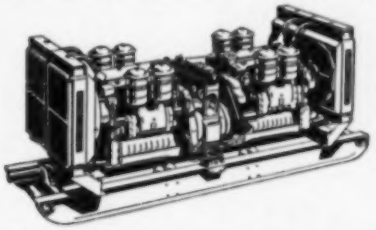
CONTAINING a total floor area of 13,200 sq ft, this two-story building houses a new factory branch store and warehouse opened by Link-Belt Co. at 2630 Holmes St., Kansas City, Mo. The new facilities will carry ample stocks of Link-Belt products for prompt service to customers in Kansas City and the surrounding area, it is reported. Arthur J. Olson is district manager in charge.

2260 hours without a minute's down time

"NEVER failed us once," says A. R. Lundahl, chief engineer of Standard Collieries, speaking of the General Motors Diesel "Quad" in this 9-yard dragline. "And it's nothing for this machine to lift 375 yards of dirt an hour, 24 hours a day."

That's because these high-powered two-cycle Diesels accelerate rapidly—they're quick on the trigger. They deliver a smooth, steady power output—twice as many power impulses for each revolution of the crankshaft. This added power-per-turn makes them more compact with more horsepower for their size than other type engines. They start instantly on their own fuel. Their clean, simple design and high interchangeability of parts make maintenance much easier.

Add up these advantages and you'll see why General Motors Series 71 Diesels are taking over so many tough jobs in mining. Let us show you how these engines can bring greater efficiency and economy to your operation. Call your GM Diesel distributor or write for details.



Standard Collieries, Clinton, Indiana, repowered this Model 6W Bucyrus-Monighan dragline with a GM Series 71 Diesel "Quad 6." Only three of the four engines are normally operated at one time—saving wear and extending engine life.

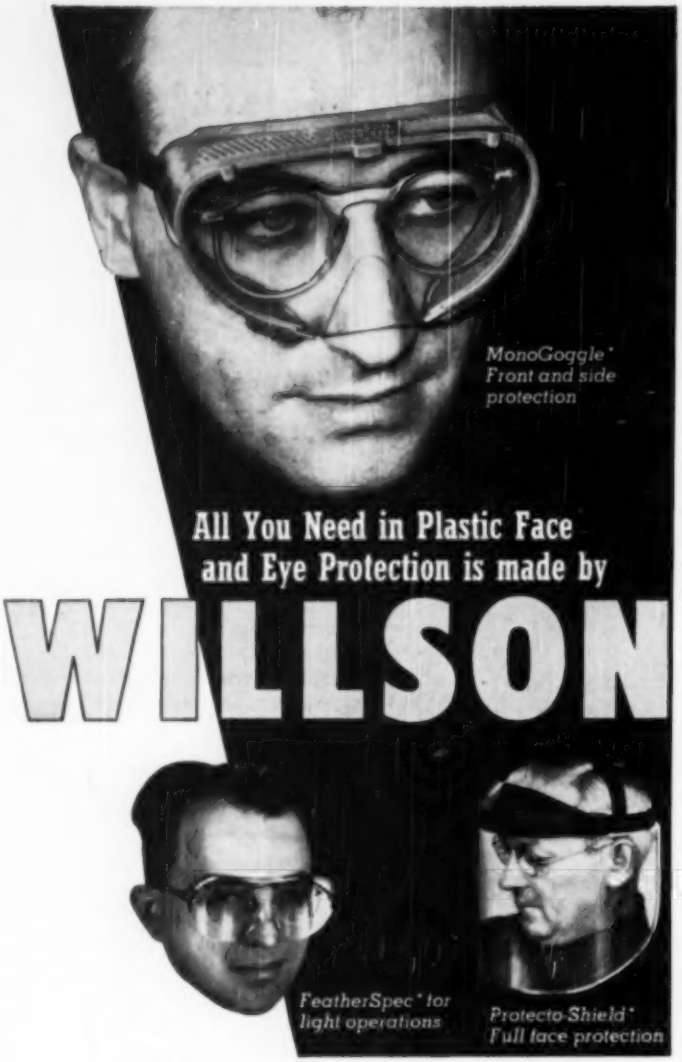
DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES . . . Up to 200 H. P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS . . . Up to 800 H. P.

GENERAL MOTORS

GM GENERAL MOTORS DIESEL POWER

DIESEL BRAWN WITHOUT THE BULK



WILLSON*
Dependable Products Since 1870

These three types of protective devices, all with one-piece plastic lenses or visors and each with many variations, give you a wide selection to meet specific requirements of work hazards. Their light weight and comfortable fit insure workers' willingness to wear them for long hours on the job. Complete information on plastic protection and other eye and respiratory safety equipment is available in the new WILLSON catalog. Get your copy from our nearest distributor or write direct to WILLSON PRODUCTS, INC., 239 Washington Street, Reading, Pa.

*T.M. Reg. U.S. Pat. Off.

new applications of Kennametal, as a project engineer. Previous to joining Kennametal, Mr. Marlett had spent about 20 yr in various tool-engineering projects for several different Chicago companies.

Hugh M. McCain has been appointed chief fuels and lubricants engineer, mining section, industrial products engineering, Gulf Oil Corp., Pittsburgh, Pa. Mr. McCain joined Gulf in 1931 as lubrication engineer for southern West Virginia and during the past 14 yr has been superintendent of industrial sales for Gulf at Louisville, Ky.

The Electric Railway Improvement Co., Cleveland, recently changed its name to Erico Products, Inc., in a move to more broadly define the company's application of its bonding and welding processes. While it continues with the various methods of arc, brazing and gas welding of power bonds, the company reportedly is especially active in developing the use of the Cadweld Process for welding copper to either steel or copper in which no outside heat is required.

The Falk Corp., Milwaukee, has appointed Arthur L. Larson assistant to the sales manager and manager of the sales inquiries division. William J. Urban, former special representative in coupling sales, has been appointed manager of that department. The new manager of distributor sales is Don K. Lambert, previously special representative in the distributor sales division. Roland E. Govan heads sales promotion, a newly organized department at Falk and working with him are Eugene H. Millmann and A. H. Kelley.

Marion Power Shovel Co., Marion, Ohio, has appointed Merle V. Lashey assistant chief engineer in charge of large-shovel design. Mr. Lashey, associated with the company for 31 yr, succeeds the late Glenn B. Heffelfinger and will direct design and engineering work on the Marion Type 5323 and 5561 shovels and the Type 7200, 7400 and 7800 walking draglines.

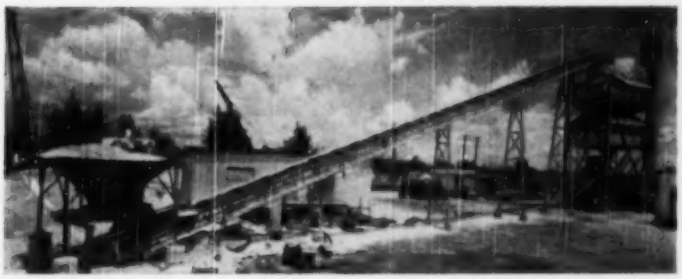
Mine Safety Appliances Co., Pittsburgh, has established an International Division to coordinate the activities of its subsidiaries in Canada, South Africa and Great Britain, and to continue the activities of the company's present export department. C. M. Donahue has been made manager of the new division, in addition to his present duties as manager of the mining division, and H. E. Redenbaugh is assistant manager.

T. H. Anderson has been appointed sales engineer for the Kensington Steel Co., Chicago, succeeding T. E. Bridgewater, resigned.

Harold H. Indestad, an engineer's assistant in the screen sales section of Allis-Chalmers basic industries machinery department since 1944, has been transferred to the company's Charleston, W. Va., district office, where he will give special attention

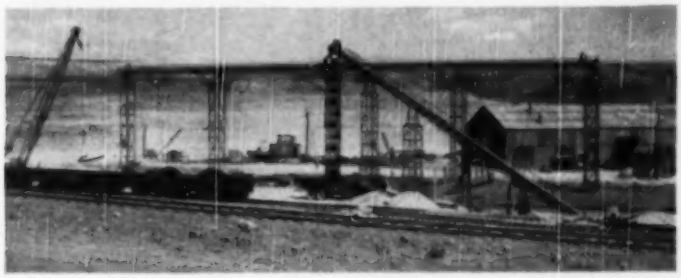
For heavy-duty conveyors . . .

IT'S TIMKEN®...



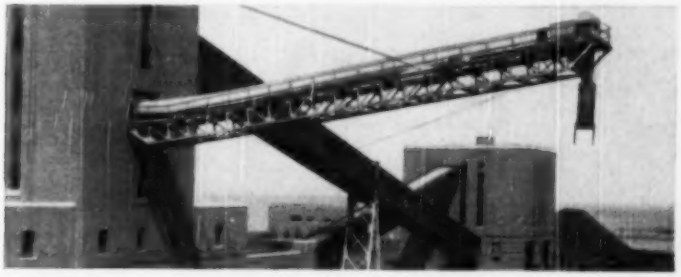
Over the years, the advantages of Timken® tapered roller bearings for conveyor belt idlers have been proved time and time again. Almost every heavy duty conveyor has relied on Timken bearings for long life and dependable, low-cost operation. This Atlas conveyor installation is only one of the thousands all over the country that roll on Timken bearing equipped idlers.

AND TIMKEN...



Recent conveyor job using Timken-equipped idlers is this Pioneer conveyor used in the Fort Randall Dam and Reservoir Project at Pickstown, South Dakota. There are 1315 feet of conveyor, 260 idlers, and 1560 Timken bearings. The installation was made in 1949. Timken bearings prevent breakdowns on the job. Keep lubricant in—dirt and moisture out. Provide maximum capacity for radial and thrust loads.

AND TIMKEN AGAIN!



And here's another new one that's Timken-equipped—a Stephens-Adamson belt conveyor in a large eastern central power station. Today, as well as for the past 25 years, Timken bearings are first choice for the tough conveyor jobs. There's no other bearing with so much to offer . . . no other bearing so fully proved! The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

Wherever the going's tough industry turns to

TIMKEN

TAPERED ROLLER BEARINGS

Typical applications of Timken bearings for conveyor idlers.

NOT JUST A BALL ◯ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST ◫ LOADS OR ANY COMBINATION ✳

TIPPLE EQUIPMENT

SHEAVES

CAGES

SKIPS

LOWERING SPIRALS

CAR PULLER AND RETARDERS

LABORATORY CRUSHERS

Modern Methods Demand Careful Handling

Breakage is practically eliminated

Separation is held to a minimum

Impact is dispelled from bin structure

when you select

HOLMES LOWERING SPIRALS

Lowering speed of coal is automatically regulated to a uniform rate, carrying it gently to the peak of the pile without droppage.

Improved design and simplified construction of Holmes Spirals assures easy erection in your bins or silos.

You are receiving the results of our more than 20 years' experience and accumulation of field data from many satisfied customers.

Why not call on Holmes engineers to assist on your coal lowering problems? We'd like to receive your inquiry—prices and recommendations will be furnished without obligation on your part.

ENGINEERS, MACHINISTS
STEEL FABRICATORS
PATTERN MAKERS
GREY IRON FOUNDERS

DANVILLE ROBT. HOLMES BROS. ILLINOIS

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VIBRATING SCREENS

DUSTOLATORS

ROBERT HOLMES & BROS., INC.
DANVILLE, ILLINOIS

to sales of products of the basic industries department.

James F. McKeone, 61, superintendent of the steel foundry of the Vulcan Iron Works, Wilkes-Barre, Pa., died Jan. 24, following a brief illness. Mr. McKeone had served in that position since October, 1944, and for the previous 18 yr was superintendent, Strong Steel Foundry Co., Buffalo.

The Euclid, Ohio, plant and equipment of the Joy Mfg. Co., Pittsburgh, has been purchased by the Lewis Welding & Engineering Corp., Bedford, Ohio, and has been organized as a separate manufacturing entity to do machine work and machine assembly work as the Breckenridge Machine Division. The plant, which is to employ 150 men, formerly was operated by the Breckenridge Machine Co. until it was taken over by Joy in 1946. Sale of the plant was in line with Joy's recently announced program of rearranging, consolidating and improving its manufacturing operations. Lewis Welding will continue to handle its work at the Breckenridge plant on a contract basis until Joy is prepared to absorb such work in other of its six factories, it was reported.

Morse Chain Co., Division of Borg-Warner Corp., Chicago, has appointed J. A. Shomer Co., 11201 Berea Rd., Cleveland 2, Ohio, as distributors in the Cleveland area. The Shomer organization specializes in power-transmission equipment and with the addition of Morse products to its present lines is expected to offer customers a complete range of such equipment.

Rome Cable Corp., Rome, N. Y., have opened a new warehouse at 156 Simpson St., N. W., Atlanta, Ga. Warehouse facilities have been provided for a complete line of wires and cables in a new building of brick construction, especially designed for quick delivery service, which will also contain the company's Atlanta district sales office. Both warehouse and sales office are in charge of C. J. McMurry, district sales manager.

Frank W. Cramer has joined the Elliott Co., Jeanette, Pa., as a consulting engineer to assist in the design, application, installation, maintenance and sales of electrical apparatus to the steel and allied industries. He will have headquarters at 718 Frick Bldg., Pittsburgh, Pa.

T. W. Marx has joined Republic Rubber Division, Lee Rubber & Tire Corp., Youngstown, Ohio, as sales representative, covering Oregon, Washington, northern Idaho and part of Montana, with headquarters in Portland.

Taylor Pipe & Forge Works, Inc., Chicago, has announced the formation of Taylor Pipe & Forge Works of Canada, Ltd., with a new manufacturing plant that will augment the company's capacity being planned for Hamilton, Ont.

GENERAL resists scrapes, cuts, bruises . . . gives more traction, more speed,

WORKS FASTER, SAFER, AT LOWER COST

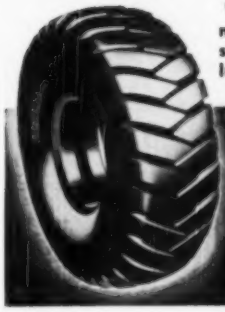
on or off the road!

For most work off the road

For most work on the road

GENERAL L. C. M.—especially designed for roughest jobs. Stronger cover and body; more natural rubber, thicker, tougher tread built into its extra traction, shock-absorbing design.

GENERAL H. C. T.—more rubber to resist cuts, bruises, snags, punctures. Deep tread grooves develop more traction off the road, safe traction on the road.



GENERAL UNDERGROUND MINING TIRE is built with more rubber to give greatest resistance to shoulder snagging, chipping, cutting. Deep, diagonal rubber lugs roll and steer easily; give maximum traction.

THE GENERAL TRUCK TIRE

SPECIFY GENERAL TIRES ON YOUR NEW EQUIPMENT

SAVES OVER $6,000 A YEAR

A Sun Mine Car Grease Cuts Breakdowns, Reduces Wheel and Axle Replacements

A coal mining company operating some 1,000 cars averaged 85 worn wheels and axles a month. The many breakdowns reduced tonnage and ran up costs—especially when they occurred underground. Some of the wheel failures were the result of normal wear, but faulty lubrication caused a large percentage of them.

One of our engineers, asked to make a survey of the operation, recommended a Sun Mine Car Grease. Changing to this "Job Proved" Product, the company noticed an immediate improvement. Wheel and axle life has increased, and there has been a sharp reduction in replacements. Savings are estimated to be at least $6,000 a year, not counting the production gained from steadier output.

Due to the superior performance of the Sun Mine Car Grease, the operators have turned to Sun for almost 100 percent of their petroleum needs—even to cutting oils in the machine shops.

This is typical of how Sun "Job Proved" Products sell themselves, once they are given an adequate trial. Sun provides the proper lubricants to prolong the life of present machines and to make available the least expensive form of production insurance for new equipment. For complete information call the nearest Sun Office. The services of a Sun Engineer are available without obligation.

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In Canada: Sun Oil Company, Ltd.
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SUN PETROLEUM PRODUCTS

"JOB PROVED" IN EVERY INDUSTRY

SUNOCO®

UMWA Cited for Contempt of Court As Miners Continue Nationwide Stoppage

DEFYING both court orders and the official instructions of their leaders, some 370,000 bituminous miners throughout the country began their second week of complete stoppage Feb. 20, as government officials under the mounting pressure of a national coal emergency sought means to combat the shutdown. Issuance Feb. 20 of a contempt citation against the union appeared to have little immediate effect on the miners' willingness to end the stoppage.

Whether the miners' defiance of John L. Lewis' twice-issued instructions to return to work was genuine was a question yet to be determined, with the union having until Feb. 27 to show cause why it should not be punished for contempt. Operators in various parts of the country reported their belief Mr. Lewis was again employing the "nod and wink" technique and that the miners were acting in accordance with the union leader's wishes, regardless of his official instructions. In any event, locals continued to vote for the traditional "no work, no contract" policy as a lack of coal rapidly brought the nation to a state of emergency. Reports originating from all parts of the country indicated the beginnings of widespread fuel rationing, brown-outs and power shortages, rail cut-backs, and steelmaking and industry shutdowns.

Temporary Order Extended

Action on the government's petition for a permanent 80-day injunction under the Taft-Hartley Act was postponed by Judge Keech, of the Federal District Court in Washington, who Feb. 20 extended his 10-day temporary order until Mar. 3. Later that day, he cited the union for both civil and criminal contempt for its failure to heed the temporary order and resume production. Departing from past practice, the citation did not include Mr. Lewis personally.

The full-scale walk-out began Feb. 11 as government officials, following the report of the President's fact-finding board, secured a 10-day temporary court injunction barring further stoppages under the provisions of the Taft-Hartley Act. Earlier, some 97,000 miners had been idle, reportedly in protest against the lack of a contract, despite Mr. Lewis' "suggestion" Jan. 11 that they return to work. Immediately on issuance of the court order, Mr. Lewis wired district presidents instructing them to effect a return to work, reportedly furnishing local officials with a copy of his telegram. The following Friday, Feb. 17, he repeated his instructions, wiring locals "to cease forthwith all stoppages and return to work without delay."

Lewis Airs Demands

In the second day of negotiations after wage talks resumed as directed by the Taft-Hartley injunction and an earlier ruling on the NLRB unfair-labor-practices petition, Mr. Lewis Feb. 16 served operator representatives with a complete list of his "suggestions" for a new contract. While it was evident as the negotiations progressed that some of the demands were made mainly for bargaining purposes, it was the first time that the union's "complete" program of contract demands had been placed before the industry since the talks began last spring. Acceptance of the 13-point program would add an estimated $1.25 per ton to the cost of coal, operators figured.

Proposals suggested by Mr. Lewis during the two sessions Feb. 17 were: (1) A guaranteed annual wage based on 200 working days; (2) 7½-hr. work day, portal-to-portal; (3) an increase in the basic wage from $14.05 to $15.50 a day, which might be lowered in exchange for other concessions; (4) eight paid holidays; (5) an increase in the welfare-fund payment from 20 to 35c a ton; (6) a new board of trustees for the fund, with the guarantee that the operators would cooperate with the union and its welfare program; (7) abandonment by the operators of all lawsuits against the union, now totaling millions of dollars; (8) an unnamed increase in vacation pay; (9) strict seniority in handling lay-offs; (10) uniform payments for tonnage miners in all fields; (11) separate contracts for strip mines, with adequnte and uniform rates; (12) a guaranteed rate for day men and piece workers to equal at least the basic day rate; and (13) an increase in shift differentials.

Negotiations Unproductive

With the resumption of negotiations on Monday, Feb. 20, after a weekend break, the talks were again devoted to discussion of Mr. Lewis' demands. Although Mr. Lewis was understood to be stressing certain of his points and soft-pedalling others, no definite progress was reported. The operators also were understood to have made concessions, reportedly having modified their stand on wage increases. After announcement of the contempt citation, some operators reported that it seemed to them that Mr. Lewis was still stalling, apparently in anticipation of government seizure. Mr. Lewis did not seem unhappy over the contempt action, the press reported, although he had no comment to make.

Several of the major stumbling blocks to a new contract agreement presumably were removed Feb. 11 when Judge Keech enjoined the UMWA from insisting on certain non-wage demands which he ruled as illegal under the Taft-Hartley Act. His order restrained the union from demanding a closed or union shop, limitation of the benefits of the welfare fund to union members, the "able and willing" clause, or the right to stop work during "memorial periods." The order was issued after a hearing

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The Month on the Labor Front

Jan. 20—Cessation of Welfare-Fund payments by bituminous operators reported as miners refusing to work without a contract total 90,000.

Jan. 22—Widespread voting by UMWA Locals against return to mines, in "defiance" of earlier "suggestion" by Lewis. Pickets prevent return of many Locals in favor. Bill introduced by Sen. Robertson to permit application of anti-trust laws to labor organizations.

Jan. 25—Dr. James Boyd, director, USBM, tells Senate committee coal emergency is at hand, with estimated supply only two or three days above danger point of 25 days' stocks.

Jan. 26—Lewis offers to resume negotiations with northern and western operators Feb. 1; ignores southern group.

Jan. 30—Total miners idle estimated at 97,000.

Jan. 31—Pres. Truman asks resumption of "normal" week under 70-day truce and proposes extra-legal fact-finding board not binding on either party.

Feb. 1—Negotiations with northern and western operators resumed. NLRB unfair-labor-practice petition argued in Federal District Court in Washington.

Feb. 2—Both northern and southern operators accept Presidential truce and fact-finding plan. Northern and western group discontinue wage negotiations as "useless" and "misleading."

Feb. 4—Lewis rejects President's fact-finding plan and truce.

Feb. 6—President invokes Taft-Hartley Act, appointing three-man board to report on issues. Work stoppage immediately begins to spread to all bituminous mines not covered by contracts.

Feb. 7—Fact-finding board begins work with informal hearings with union and operator representatives.

Feb. 8—Formal hearings of board are followed by resumption of wage negotiations at its request, with members of the board sitting in.

Feb. 9—Federal Judge Keech, ruling on NLRB petition, declares major union demands exclusive of wage demands to be unfair labor practices. President's board ends hearings and bargaining sessions and begins report to White House.

Feb. 11—UMWA enjoined by Judge Keech, pending final ruling by NLRB, from making certain non-wage demands, refusing to bargain collectively and striking in support of such demands. Fact-finding board reports to President. Order issued by Judge Keech at government's request restrains union from striking for 10-day period under terms of Taft-Hartley Act, instructs union to order men back to work and directs all parties to resume collective bargaining. Lewis immediately wires district presidents of court orders.

Feb. 13—Entire bituminous field down as miners defy Taft-Hartley injunction.

Feb. 15—Negotiations resume, with fact-finding board sitting in as observers. Southern operators participate but reserve right to separate agreement.

Feb. 16—Lewis presents operators with first complete list of "suggestions" for new contract since opening of negotiations last spring, reportedly adding an estimated $1.25 a ton to mining cost.

Feb. 17—Lewis wires all locals "to cease forthwith all stoppages and return to work without delay."

Feb. 20—UMWA cited by Judge Keech for civil and criminal contempt as 370,000 miners ignore Lewis' instructions and remain idle. Government request for permanent 80-day injunction taken under advisement by Judge Keech, who extends temporary 10-day order to Mar. 3. Negotiations resumed after weekend "breather."

on the unfair labor charges brought by the NLRB general counsel and is effective only until the NLRB itself rules on the charges, which may not be for some months.

President Truman's use of the Taft-Hartley Act, which he had previously avoided, came after it became obvious that no other method of settlement was available, outside of seizure. His earlier suggestion that a "normal" week be resumed under a 70-day truce while an extra-legal fact-finding board determine the issues was accepted by the operators. Mr. Lewis, however, rejected the plan, writing the President that the mineworkers did not wish "three strangers" to determine their wages or working conditions.

The three-man fact-finding board, consisting of David L. Cole, chairman, Dr. John T. Dunlop and Prof. William Willard Wirtz, began its work the day after its appointment with informal discussion with both groups. On the next day, after a short formal hearing, negotiations were resumed at the board's request, with its members sitting in as observers. After part of another day's sessions, the board called off the negotiations and began preparation of its report to the President. In its report, the board blamed both sides for the stalemate. Although the non-wage demands were not insignificant, it said, it felt that the basic dispute was over increases in wages and the welfare contribution. Once these were resolved, the other questions could be solved, board members reported. The fencing stage of the bargaining process had been carried on too long and had resulted in making voluntary settlement more difficult, they declared.

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Mines Bureau to Study All Mine Fatalities

In a move designed to strengthen its accident-prevention work, the U. S. Bureau of Mines plans to investigate every fatality occurring in coal mines throughout the country, Secretary of the Interior Oscar L. Chapman announced last month. The studies will be made by the Bureau's coal-mine inspectors and their purpose will be to learn the facts, determine the cause and make recommendations to prevent similar accidents.

Previously, the Bureau has investigated all major coal-mine disasters and published its findings. Only occasionally, however, has it investigated single fatalities and, when it has, the reports usually have been kept in its files. According to Secretary Chapman, several factors were responsible for this former policy, including the small number of federal inspectors, the large number of fatalities and the difficulty of learning of isolated fatalities soon enough for an inspector to get to the scene before conditions prevailing at the time of the accident had changed.

One of the advantages in the investigation of all fatalities, it is reported, is that it will give the inspectors an opportunity to discuss accident prevention with mine officials and miners at a time when it is likely to do the most good. It will also increase the knowledge of accident causes, on which the Bureau's safety work is based. It is expected that most mine operators will cooperate with the new program by notifying the Bureau promptly when a fatality occurs, once the purpose of the investigations is appreciated.

As presently planned, the fatality investigation reports will be distributed to operators, the union, and the respective state mining departments, as is the case with the coal-mine inspection reports.

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Personal Notes

James W. Haley has resigned as secretary and general counsel, National Coal Association, effective Mar. 1, to become vice president of the Jewell Ridge Coal Corp. and Virginia Smokeless Coal Co., with headquarters in the Southern Bldg., Washington, D. C. Mr. Haley has been with National Coal since 1937, and has been

CHANCE... the ORIGINAL and LEADING "heavy density" PROCESS for cleaning coal

The Chance Sand Flotation Process produces a higher percentage of clean coal, with least waste, at lowest cost per ton cleaned . . . facts that are supported by the records of mines of every size in leading bituminous fields.

All this is the result of the high separating efficiency of the Chance Process . . . its dependable performance . . . high capacity . . . flexibility . . . low operating and maintenance costs.

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WITH A BACKGROUND OF OVER SIXTY YEARS' EXPERIENCE

secretary and general counsel since October, 1948. He also is general counsel and assistant treasurer, Coal Exporters' Association; treasurer and member of the executive committee, Federal Power Bar Association; secretary, Fuels Research Council, Inc.; and chairman of the coal committee of the American Bar Association.

George E. Owen, formerly vice president, has been elected president, Imperial Coal Corp., New York, succeeding **Charles A. Owen**, named chairman of the board of directors. **Harry B. Bartley**, formerly assistant to the president, has been elected a vice president, succeeding George E. Owen.

H. R. Hawthorne, formerly vice president, has been elected president, Pocahontas Fuel Co., Inc., and Pocahontas Corp., New York, succeeding the late O. L. Alexander. **Joseph H. Bowen**, Bluefield, W. Va., has been elected chairman of the board of Pocahontas Fuel, and **A. H. Collins**, vice president, has been named a member of the board. **L. B. Crawford** has been elected secretary and **Paul W. Jenkins** has been made assistant to the president.

Milo W. Summers has been elected vice president of the Westmoreland Coal Co., Philadelphia. Mr. Summers has for some time been general manager of the company, in charge of its Hampton mine in West Virginia.

W. C. Page, formerly assistant manager, western operations, U. S. Smelting, Refining & Mining Co., has been named general manager of western operations and vice president of the U. S. Fuel Co., Salt Lake City, succeeding **F. S. Mulock**, recently made vice president of operations for the smelting company and president of the fuel company (*Coal Age*, February, p 150).

George H. Love, President, Pittsburgh Consolidation Coal Co., Pittsburgh, has been elected a member of the board of directors of the General Electric Co., Schenectady.

Frank Doxey has been named assistant general manager, Cape Breton coal operations, Dominion Steel & Coal Corp., Ltd. Mr. Doxey came from England last spring to join the company as assistant to the general manager.

Dr. Hamnett P. Munger has been named by Battelle Memorial Institute, Columbus, Ohio, to coordinate its air-pollution research activities and to act in a liaison capacity between Battelle and industry. Dr. Munger, who joined Battelle in 1948, has had 20 yr of varied industrial and professional experience in chemistry and chemical engineering.

Gustin V. Leffler has been appointed to supervise the farming and reclamation activities of the Pittsburg & Midway Coal Mining Co., Pittsburg, Kan. A graduate of Iowa State College, specializing in forestry and range management, Mr. Leffler previously was with the Soil Conservation Service in Texas.

Several personnel appointments at the Weirton mine of the National Mine Corp. have been announced by George Rigg, manager. **Emell Snuffer** joined the organization Jan. 1 as assistant mine superintendent. **Arnold Phillips** and **Wendell W. Mace** joined the company Feb. 1 as outside and inside maintenance foremen, respectively. Clarence Cook, formerly substitute washery foreman at the Isabella mine, and Edward Hannell, mechanic at Isabella, have been made washery foremen at the Weirton mine.

R. M. Fleming has been appointed to the mining staff of the School of Mineral Industries, Pennsylvania State College, State College, Pa., as a professional lecturer on management. Mr. Fleming retired last Sept. 1 as general manager of the Ebensburg Coal Co., Colver, Pa.

J. J. McCann has been appointed minister of mines and technical surveys in the British Columbia government.

C. E. Self, formerly faceboss, has been appointed safety engineer, Kaiser Sunnyside No. 2 mine, Kaiser Steel Corp., Sunnyside, Utah.

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Obituaries

Oakey Logan Alexander, 68, president, Pocahontas Fuel Co., Inc., Pocahontas Corp., and affiliated companies, New York, died unexpectedly Jan. 21 in Roosevelt Memorial Hospital, New York, following a heart attack while he was in the hospital for a routine check. Mr. Alexander, who had been with Pocahontas Fuel for many years, was named a vice president in 1918 and became president in 1932. At the time of his death, Mr. Alexander was president, Pocahontas Operators' Association, Bluefield, W. Va., and was a member of the executive board of the National Coal Association. He had been a member of the NCA board of directors since its organization. Mr. Alexander was widely known throughout the coal industry for his interest and activity in its affairs. He also was affiliated with several other business organizations and was active in numerous civic and social organizations.

Harry B. Crane, 65, general superintendent, The Elk Horn Coal Corp., Fleming, Ky., died Jan. 18 in a Ft. Lauderdale, Fla., hospital. Mr. Crane had been associated with Elk Horn for over 25 yr and was widely know in the Eastern Kentucky region. He had been in poor health recently and had gone to Florida shortly after Christmas to spend the winter.

J. B. Marcum, 48, general manager, Blue Bird Mining Co. and Black Gold Mining Co., Hazard, Ky., died Jan. 31 at Hazard, following an illness of several months. Mr. Marcum, who had been active in the Eastern Kentucky area for more than 20 yr, was president and a director of the Kentucky River Mining Institute.

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Association Activities

Kanawha Valley Mining Institute has elected new officers for 1950, as follows: president, A. W. Fleugel; executive vice president, C. L. Milligan; vice presidents, R. O. Hamer, Rush Meadows, and J. A. Willis Jr.; secretary, Lee M. Morris; treasurer, William Buchanan; and assistant treasurer, W. B. Devaney.

Harlan Mining Institute has elected new officers, as follows: Mallalus Robbins, president; Walter Adams, Lawrence Bassham and Carl Mercer, vice presidents. C. W. Denham was re-elected secretary-treasurer.

Stoker Mfgs. Association has named D. L. Getz, chairman of its engineering and research committee. Mr. Getz is chief engineer, Steel Products Engineering Co., Springfield, Ohio.

Midwest Stoker Association, at its annual meeting Feb. 1, elected as president, F. H. Herndon, president, Herndon Sales & Service Co. P. I. Bohmann, regional manager, U. S. Machine Corp., was elected vice president; and Charles H. Wilson, manager, Park Heating Sales, was named secretary-treasurer.

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Preparation Facilities

Motley Coal Co., Mayfield, Pa.—Contract closed with Menzies Separator Co. for one 2-ft Menzies Cone to clean rice coal and one 2-ft Menzies Cone to clean barley coal; feed capacity of each, 10 tph.

Consagra Coal Co., Blakely, Pa.—Contract closed with Wilmot Engineering Co. for one Type D jig for egg- and pea-coal refuse; feed capacity, 20 tph.

Lehigh Valley Coal Co., Prospect Colliery, Wilkes-Barre, Pa.—Contract closed with Wilmot Engineering Co. for one 7-ft-diameter Hydrotator for buckwheat No. 1 coal; feed capacity, 400 tph.

Penna Coal Co., Minersville, Pa.—Contract closed with Wilmot Engineering Co. for one 2½-ft-diameter Hydrotator for pea coal; feed capacity, 20 tph.

MILLION TON TORTURE TEST

...READY FOR MORE!

QUAKER CONVEYOR BELTING

PERFORMANCE-PROVED TO GIVE LONGER SERVICE

Day in day out . . . year after year . . . for eleven years more than a million tons of rock smashed down and was carried along by a Quaker Ironsides Conveyor Belt. This 24" wide belt takes an impact drop of four feet and runs on a grade that starts at four feet off the ground to a height of 55 feet . . . carries 60 to 100 yards of material per hour. After a million tons it is still good for many more.

Whatever your belting need in the coal industry . . . above or below the ground . . . flat transmission belts, V-belts or conveyor belts, you can rely on Quaker for long performance-proved service. Every belt built by Quaker is thoroughly pre-tested in the plant . . . every type has been performance-proved on the job. To economize on belting, you'll find it pays to Quakerize your operation.

QUAKER PACKINGS FOR SAFER SEALS

Scientifically pre-tested . . . ruggedly performance-proved Quaker Packings are engineered for every use in the coal industry—for pumps, compressors, water or steam lines, valves and many other places where positive seal is a "must."

QUAKER HOSE FOR RUGGED WEAR

Pre-tested for flexing and strength . . . performance-proved for rugged resistance to abrasion and wear, every Quaker Hose has been scientifically developed for a specific application . . . to give longer service. Quaker Hose is available for use with air, water, steam, volatiles, acids and gases.

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QUAKER RUBBER PRODUCTS

custom made for every industrial use

Improved Safety Record Chalked Up for Fourth Consecutive Year . . .

COMPANY TROPHY for the safest mine is presented by P. D. Ritter (left), president, to E. S. Ferrell, assistant superintendent, Mitchell Branch mine, with William M. Ritter, general manager, seated at the left. Mitchell Branch officials (right photo, seated) include Tony Webb (left), general foreman, E. S. Ferrell, assistant superintendent, A. F. Cook, superintendent, and E. S. Burleson, general mine foreman. Company officials and those of other mines standing behind them are J. E. Jones (left) and J. A. Damron, superintendents, Fred Kyle, general foreman, D. L. Haca, superintendent, R. A. Ison, assistant general manager, and J. J. Plasky, training and safety director.

Red Jacket Marks 1949 Safety Gains

CELEBRATING ITS FOURTH CONSECUTIVE YEAR of marked improvement in safety, the Red Jacket Coal Corp. Jan. 14 entertained its foremen at a dinner held at the Mountaineer Hotel, Williamson, W. Va. During the past year, 116 foremen of the 206 employed supervised sections in which not a single lost-time accident occurred, an increase of 94 over the 22 so honored in 1946 when 196 foremen were employed. Some 930,000 tons was mined without a lost-time accident in 1949 and man-hours of exposure for the 116 winning foremen totaled 1,368,830. Of these, 30 foremen had a perfect record for 2 yr, 14 for 3 yr and four for 4 yr.

The company trophy for the best mine safety record was won by the Mitchell Branch mine, producing 3,500 tpd. It has operated for the past 17 months without a fatality and during 1949 had only one lost-time accident from roof falls. Only three roof-fall accidents have occurred in the mine in the past two years. E. S. Ferrell, assistant superintendent, accepted the trophy on behalf of officials and men.

Certificates of Merit, honor-roll buttons and white safety hats were presented by a series of speakers to the groups of foremen whose crews had gone without an accident for 1, 2, 3 or 4 yr. The four foremen capturing top honors by supervising sections without accidents for the past four consecutive years were: Haywood Dean and J. Carl Cook, Junior mine; and Grover Bradford and T. D. Jordan, Wyoming mine.

Company officials and visitors who presented awards or participated in the program with short talks included: P. D. Ritter, president; William M. Ritter, general manager; R. A. Ison, assistant general manager; A. F. Cook, superintendent, and J. J. Plasky, training and safety director, Red Jacket Coal Corp.; A. U. Miller and Eugene Quenon, supervising engineers, USBM, Mt. Hope, W. Va.; W. H. Tomlinson, supervising engineer, USBM, Norton, Va.; and Earl Maize, safety director, National Coal Association.

Foremen receiving awards for their records, in addition to the 4-yr men previously listed, were as follows:

No Lost-Time Accident for 3 Yr, 1949, 1948, 1947—Wyoming mine: Roy Short, C. W. Bellew, G. A. Neal, Guy Barrett and Hubert Thomas; Junior mine: Lewis Hardesty, Clyde Hammond, Lewis Simpkins and Jones Kennedy; Keen Mountain mine: Norman Presley and R. S. Dean; Mitchell Branch mine: Charles Turk; Coal Mountain No. 9; Mike Ferrell; Coal Mountain Outside: Light Hatfield.

No Lost-Time Accident for 2 Yr, 1949, 1948—Junior mine: Dayton Johnson, Ance Kennedy, William Carey, F. C. Daniels, John Fowler, Mont Howell and Sephas Wicker; Mitchell Branch: Homer Malone, Jerry Ison, C. L. Eanes, Howard Radford, E. K. Toler, Amon Workman and Dominick Clusky; Coal Mountain Outside: Don Shields; Keen Mountain: John Spradlin, A. K. Hooker, Ed Steele, Leonard Skeens, Luther Dillon, W. O. Bohon and Lester Mabe; Wyoming: R. C. Collins, T. E. Sizemore, Tommy Bailey, Dan Winters, Fred Shannon and Charles D. Smith; Coal Mountain No. 12: Joe Browning and Clyde Morgan.

No Lost-Time Accidents During 1949—Keen Mountain: Charles Owens, S. A. Cook, Millard Plymal, Roy Thompson, Jack Ratliff, Henry Hill, George Thomason, Harry Danielson, Clyde Looney, Eugene Farmer, W. W. Harlow, William Dye, Earl Fletcher, Curt Matney, Evan Edwards, Eram Kennedy, Frank Stout and Joe Henderson; Wyoming: R. H. Sturgill, Hulen Mullens, C. R. Shelton, Oley Stewart, Walter Akers, Carl Parks, Ira Bradford, Bill Hodges, Herbert Short and Walter Blankenship; Coal Mountain No. 12: Charles Thompson, Connie Cline, William McGinnis, Ted Morgan, Vencil Travis, J. B. Staten and Elmer Blizzard; Mitchell Branch: Charles Pruitt, Ed Blankenship, Jim Martin, H. B. Artis, Lonnie Hamby, Lawton Chafin, Arson May, Irvin Smith, Claude Meade, Perry Hackney, Amos Williamson and Reece Ferrell; Junior: Jim Backus, C. H. Meadows, A. L. Preston, Raymond Stiltner, Dave Ratcliff, George Spears, Estil Keith, George Williamson Jr., Grant Henson, Garland Moore, C. E. Edwards and Walter Edwards; Coal Mountain No. 9: Orville Godfrey, Winfred Belcher and Jesse Fortner; Red Jacket Outside: Grant Willis, Lawrence Hatfield, Harry Davis, D. B. Tate and Ernest Stallard; Coal Mountain Outside: Frank Mosolgo.

Foremen who cleared their records through the merit system after having one or more lost-time accidents during 1949—Wyoming: Dale Browning, Bill Lester, Ed Riddle, Fred

As 116 Foremen Are Honored for Year or More With Accident-Free Crews

FOUR YEARS without an accident to crews.

THREE YEARS without accident—Total, 14 Foremen.

TWO-YEAR safety record—Total, 30 foremen.

ONE YEAR accident-free—Total, 68 foremen.

Thomas, Doug Halstead, E. E. Taylor, Floyd McCoy and W. M. O'Neal; Mitchell Branch; F. N. Bensey, Fred Kyle, Bill Curry, Emory Osborne and Herbert Williamson; Junior: Nakomas Sloan, A. A. Mankin, Bill McClure and Dan Hammond; Keen Mountain: Clifford Kelly, J. K. Simpson and Darrell Gillespie; Coal Mountain Outside: Don Hatfield and Mike Stokes; Coal Mountain No. 9; Gussie Morgan.

MEETINGS

- New York State Retail Solid Fuel Merchants' Association: spring conference, Mar. 30, Hotel New Yorker, New York City.
- Midwest Power Conference: 12th annual conference, sponsored by the Illinois Institute of Technology with the cooperation of 18 midwestern universities and professional societies, April 5-7, Hotel Sherman, Chicago.
- Canadian Institute of Mining and Metallurgy: annual meeting, April 17-19, Royal York Hotel, Toronto, Ont., Can.
- American Mining Congress: coal convention, April 24-26, Netherland Plaza Hotel, Cincinnati, Ohio.
- Midwestern Retail Coal Association: annual meeting, May 15-16, Savery Hotel, Des Moines, Iowa.
- Virginia Coal Operators' Association: annual meeting, May 18, Norton, Va.
- Mine Inspectors' Institute of America: 40th annual convention, June 5-7, Hotel Prichard, Huntington, W. Va.
- Rocky Mountain Coal Mining Institute: annual meeting, June 19-21, Hotel Colorado, Glenwood Springs, Colo.

Your Activities Are Interesting, Too!

WON'T YOU JOIN the many coal-mining companies who make it a point to help us keep the industry informed of what's going on by regularly writing us of newsworthy events concerning their organization as they occur? COAL AGE will gladly welcome such information from you also—personnel changes among operating officials, details of mine-development and modernization programs, unusual safety and production achievements, annual staff functions, and other activities of interest. Please include pictures when available and address: News Editor, COAL AGE, 330 W. 42d St., New York 18.

Claude Congleton (left), general manager, Fayette-Jellico Coal Co., Warren, Ky.; R. C. Scott, general manager, Cornett-Lewis Coal Co., Louellen, Ky.; F. L. DuPree, vice president, Clover Darby Coal Co., Closplint, Ky.; and John D. Battle, executive vice president, National Coal Association.

D. A. Thomas (left), president, Boothton Coal Mining Co., Boothton, Ala.; and Calvin Holmes, president, Holmes Darst Coal Corp., Knoxville, Tenn., at the annual meeting of the National Coal Association.

COAL MEN ON THE JOB

K. D. Albaugh (left), superintendent; Troy Grizell, mine foreman; and W. E. Straley, chief electrician, Maust Coal & Coke Co., Jerrysville, W. Va.

J. B. Bennett (left), superintendent, and Charles C. Clevenger, chief electrician, Sewell Chief mine, Wooldridge Coal Mining Co., Richwood, W. Va.

D. F. Barnett (left), pit foreman, and Alva Jones, superintendent, Rich Sewell Coal & Coke Co. stripping, Jerrysville, W. Va.

C. D. Campbell, chief electrician and master mechanic, Bunker mine, Trotter Coal Co., Cassville, W. Va.

Photographers, Take Note!

COAL AGE WILL WELCOME from you "on-the-job" photographs of coal mining supervisory officials for use in this section. So why not make it a point to photograph your fellow officials in groups of four or five and send us the results. They'll be pleased to have their pictures published and COAL AGE will gladly pay you for each photo used, on publication. Please be sure to include the full name, title and mine operation of each individual and enclose the negatives of all photos, which we will return. Address: The Editor, COAL AGE, 330 W. 42d St., New York 18.

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UNITED STATES STEEL

BCR Stresses Coal Application

Stiffer Competition Requires Increased Emphasis on Equipment Development and Merchandising to Get Full Benefits From Research and Realize on Opportunities—Program and Results Summarized at Cincinnati Meeting

WHAT RESEARCH IS DOING and can do more to help the bituminous industry meet present and future competition was the theme of the 1950 annual meeting of Bituminous Coal Research, Inc., Netherland-Plaza Hotel, Cincinnati, Ohio, Feb. 9. Departing, therefore, from the program themes of the past, the organization stressed not only the present competitive picture but also the need for putting research results into effect through intensified development and promotion of equipment based on the results of research.

With J. B. Morrow, president, presiding, the business session brought out that membership now stands at approximately the same level as in the previous year. It was emphasized, however, that to carry out the program now seen as necessary new members must be recruited or the assessment raised. Mr. Morrow cited the need for some industry agency to really get behind the development and sale of equipment. A. B. Foulger, president, Lion Coal Corp., Ogden, Utah, recommended the establishment of a committee to investigate the design of equipment now being offered for sale, with the goal of getting design defects remedied.

It was announced that Class A directors had been appointed, as follows: Edwin H. Davis, president, New York Coal Co., Columbus, Ohio; Mr. Foulger; H. A. Glover, president, Island Creek Coal Sales Co., Huntington, W. Va.; D. E. Griffith, president and general manager, Pruden Coal & Coke Co., Pruden, Tenn.; Ralph E. Jamison Jr., sales manager, Jamison Coal & Coke Co., Greensburg, Pa.; S. S. Nicholls, vice president, C. H. Sprague & Son Co., New York; C. J. Potter, president, Rochester & Pittsburgh Coal Co., Indiana, Pa.; and R. H. Sherwood, president, Central Indiana Coal Co., Indianapolis.

Class B directors serving the second of a two-year term are: George Dunglinson Jr., executive vice president, Norfolk & Western Ry., Roanoke, Va.; B. R. Gebhart, vice president, Chicago, Wilmington & Franklin Coal Co., Chicago; J. B. Morrow, first vice president, Pittsburgh Consolidation Coal Co., Pittsburgh; M. J. Patton, vice president, Truax-Traer Coal Co., Cincinnati; P. B. C. Smith, president, Southern Coal Co., Chicago; R. D. Stockdale, president, Red Jacket Coal Sales Co., Columbus; D. A. Thomas, president, Boothton Coal Mining Co., Boothton, Ala.

With R. D. Stockdale, president, Red Jacket Coal Sales Co., presiding, the initial technical session got under way with a discussion on "Facing the Facts in Fuel Trends." Prepared by George A. Lamb, manager of business surveys, Pittsburgh Consolidation Coal Co., the discussion was read in his absence by Glen L. Parker, company business analyst.

Pointing to changes in the business situation, high temperatures, increased oil imports, higher consumption of natural gas and the rapid spread of the diesel locomotives, Mr. Lamb declared that all these have shrunk coal markets at a time when coal was particularly vulnerable because of labor trouble. As a result, production in 1950 probably will be only slightly higher than in 1949. Research is a vital tool in achieving a change favorable to coal, Mr. Lamb contended. As to its value, he pointed to the investment of the diesel industry when it was merely the hope that it could break into the locomotive market. And research, he continued, need not be on something new. Electric power, for example, is in that class and is a major coal outlet. Extending electric

(*Continued on p.* 174)

Mining, Safety, Cleaning Are Top AIME Themes

Coal Division Hears Latest Facts on . . .

Mining With Modern Machines and Methods
Preventing Fires and Controlling Dust
Fine-Coal Cleaning and Plant Efficiency
Coal-Mining Practice Around the World

MODERN MINING MACHINES and methods, maintenance, safety, training and coal preparation were the high spots in the program of the annual meeting of the Coal Division, AIME, in New York City, Feb. 13-15. Over 200 leading engineers in the industry who registered for the sessions heard 15 professional papers on a wide variety of subjects and a symposium on American mining machines and men abroad.

Continuous mining experience, simultaneous mining of contiguous beds and top management's responsibilities in maintenance were discussed at the opening technical session of the Coal Division on Monday morning. J. W. Woomer, J. W. Woomer & Associates, and H. P. Greenwald, U. S. Bureau of Mines, presided.

J. J. Snure, production manager, Rochester & Pittsburgh Coal Co., Indiana, Pa., presented his company's experience with 12 continuous mining machines in West Virginia and Pennsylvania mines. Better systems of mining and improved transportation practices must be developed to take full advantage of the production possibilities of these machines, Mr. Snure said. Output has been disappointing in many cases, but will improve as experience is gained. Continuous mining must be adopted in the near future by many companies if they are to survive, he maintained. (For an earlier discussion of this subject by Mr. Snure, see p 95 of this issue.)

The problems involved in mining several seams in the same area were discussed by A. B. Crichton, president, Johnstown Coal & Coke Co., who presented a paper prepared by H. H. Hasler, chief engineer, Pennsylvania Coal & Coke Corp. Case histories of several operations in Pennsylvania and West Virginia bituminous areas were cited to illustrate the problems encountered in controlling roof and floor during recovery from overlapping seams. Impounded water, at higher elevations than the active workings, is one of the major problems, Mr. Crichton stated.

(*Continued on p* 162)

Wellman will build it

Special Cranes
Mine Hoists
Car Dumpers
Gas Producer Plants
Ore Bridges
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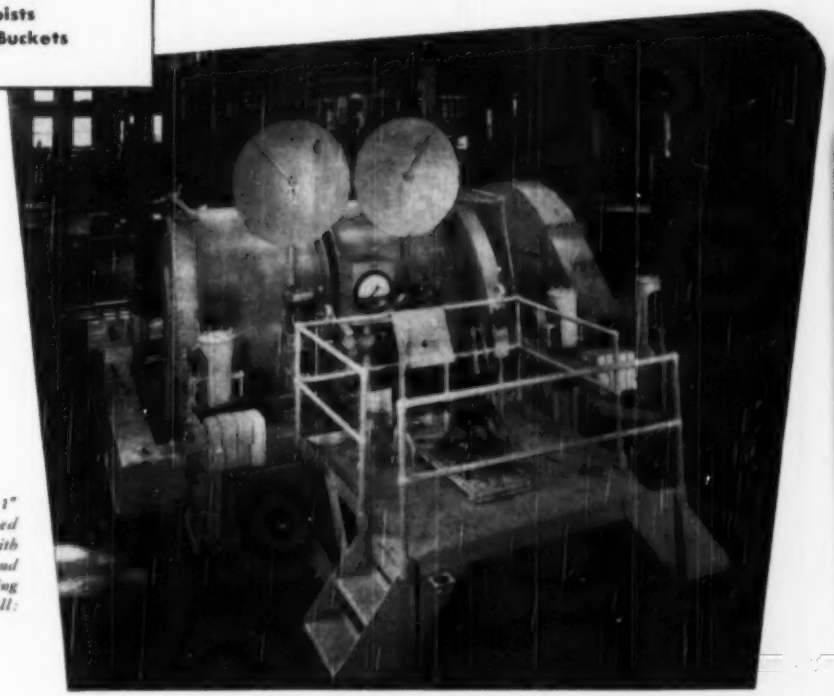
Proved by performance



Wellman 10' x 4' 11" Double Drum Geared Electric Mine Hoist with 7' axial plate clutch and 10' x 13' Parallel Acting Brakes. Rated rope pull: 22,000 lbs.

● For more than half a century, in mines all over the world, Wellman Electric Mine Hoists have been used because they combine expert design with expert construction . . . featuring all the "modern improvements" developed in our 50 years' experience. Wellman Mine Hoists provide maximum safety, peak economy, and trouble-free operation under a wide variety of conditions. Let us give you recommendations for hoists that will do your job most satisfactorily.

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SAVE TIME and DOLLARS with these Liner Plates

You can speed your next mine entry job and save money by using Armco Tunnel Liner Plates.

These sturdy plates are easy to handle, and install because there is no excess weight or bulk. One unskilled workman can carry, hold and bolt into place an Armco plate, using only a structural wrench. The job goes fast and you save on labor costs.

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Armco Plates are designed for utmost strength. They look strong and *are* strong. You'll have no weak spots in your liner because the deep corrugations are continuous across the joints.

Use Armco Tunnel Liner Plates for greater economy in driving sloped or vertical entries, air shafts, escapeways, and conveyor tunnels. They are also ideal for relining and strengthening existing passageways. Write for data. Armco Drainage & Metal Products, Inc., 3670 Curtis Street, Middletown, Ohio. Export: The Armco International Corporation.

ARMCO Tunnel Liner Plates

EQUIPMENT APPROVALS

Eight approvals of permissible equipment were granted by the U. S. Bureau of Mines in January, as follows:

Jeffrey Mfg. Co.—Type 70U universal cutting machine; two motors, 25 and 50 hp, 500 v, dc; Approval 2-701A; Jan. 18.

Jeffrey Mfg. Co.—Class 63 distribution box; three branch circuits, 500 v, dc; Approval 2-708A; Jan. 12.

Joy Mfg. Co.—Type 4WS-2E/F water spray; one motor, 5 hp, 250 and 500 v, dc; Approvals 2-711 and 2-711A, respectively; Jan. 3.

Jeffrey Mfg. Co.—Type 52 power unit; one motor, 50 hp, 230 v, dc; Approval 2-712; Jan. 11.

Joy Mfg. Co.—Type 18HR-1N rock loader; four motors, one 50 hp, two 7½ and one 4 hp, 500 v, 50 cycles, ac; Approval 2-713A; Jan. 16.

Joy Mfg. Co.—Distribution box; three branch circuits, 500 v, 50 cycles, ac; Approval 2-714A; Jan. 25.

Long Super Mine Car Co.—Type 5-hp conveyor power unit; one motor, 5-hp, 230 and 500 v, dc; Approvals 2-715 and 2-715A, respectively; Jan. 26.

Long Super Mine Car Co.—Type 10-hp conveyor power unit; one motor, 10 hp, 230 and 500 v, dc; Approvals 2-716 and 2-716A, respectively; Jan. 30.

•

Consol (Ky.) Marks Safety Achievements

The annual safety meeting of the Consolidation Coal Co. (Ky.), Div. of Pittsburgh Consolidation Coal Co., Jenkins, Ky., was held Feb. 18 in the Norton Hotel, Norton, Va., with the company's foremen, superintendents, department heads, executives and guests enjoying a four-course dinner.

A feature of the evening was the presentation by G. O. Tarleton, vice president, of engraved gold pocket watches to Foremen N. L. Akers and Rex Lawrence for 6 yrs. of work underground without an employee under their supervision suffering a lost-time injury. Foremen Willie Baker, R. D. Kyle, Dewey Looney and Arnold Kelley also were awarded watches for attaining such a record during the past 5 yrs.

Gold lapel buttons were awarded to 42 other foremen for working 1, 2, 3 or 4 yrs. without a lost-time accident occurring to their crews.

S. M. Cassidy addressed the meeting, expressing the company's appreciation to the foremen of their efforts in accident prevention and for the improvement over previous years.

Strip mine speeds coal recovery

How "Nitramon"* helped simplify a tough shooting problem

The Bailey Construction Corporation had to remove a heavy sandstone overburden in a West Virginia Strip Mine. Here is the blasting plan worked out in cooperation with Du Pont Explosives representatives:

The drilling pattern called for two rows of well drill holes—the first, 32 feet back from the toe; and the second, 20 feet behind the first. Space between holes averaged 21 feet. The shot illustrated contained 57 holes averaging 65 feet deep. Each hole was loaded immediately after drilling and the shot contained 44,700 lbs. of Du Pont "Nitramon" No. 2.

Good results after the blast. More than 40% of overburden thrown clear of coal seam; excellent top breakage, and low muck pile.

"Nitramon," the safest blasting agent, was recommended and adopted for this job because of its safety and economy. Unaffected by a blasting cap, friction, or impact, it is detonated with relatively insensitive "Nitramon" primers initiated with "Primacord." It is the only blasting agent adapted to loading holes that must stand for long periods before firing . . . and loading right after drilling avoids expensive cleaning and redrilling of holes.

Whatever your blasting problems, plan to call in your Du Pont Explosives representative. His long experience and technical knowledge can help you determine the safest, most economical, most efficient procedure to follow. He's a good man to know. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

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"Monobel" AA—Best-selling permissible. Economical producer of lump coal . . . has good water resistance.

"Lump Coal" C—Has a slow, heaving action that pushes coal out away from the face . . . makes for easy loading.

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Exclusive safety features:
Nylon-insulated wire—Rubber plug closures—Aluminum foil shielded shunts.

DU PONT MULTIPLE-SHOT PERMISSIBLE BLASTING MACHINE

Compact. Sturdy. Water-resistant. A ten-cap unit of the twist type.

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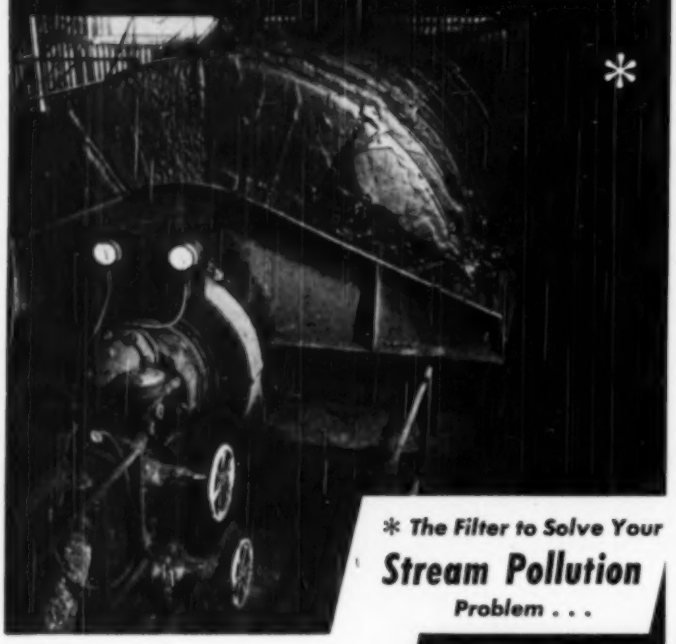

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Let this filter "funnel" all wash water from your washery and you will have a filtrate suitable for stream discharge . . . a filtrate practically free of fine coal and silt. And it's quite flexible in that it can handle surges from settling basins or other facilities for settling out solids.

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Fireboss Issue Before W. Va. Supreme Court

The West Virginia state supreme court agreed Feb. 6 to determine the legality of section foremen making fireboss inspections, granting an appeal from a Kanawha County circuit court which had ruled that one man could perform both duties.

The appeal was requested by Arch J. Alexander, chief, W. Va. Department of Mines, who had ordered separation of the duties in accordance with an opinion of the state attorney general, as previously reported.

The practice of having section foremen make fireboss inspections had long been followed in many West Virginia mines and Mr. Alexander's ruling was contested by a group of operators, who won an order from the state supreme court barring enforcement of the ruling until it could be argued before the courts.

•

Kanawha Valley Interests Set Up Smoke-Control Plan

Mayors of political subdivisions in the Kanawha Valley have been urged to organize a general committee of industry to study air pollution and find ways to abate the smoke nuisance. This recommendation was part of a report following a survey of air pollution undertaken by the Coal Producers' Committee for Smoke Abatement. The report was presented Jan. 26 to over 150 persons meeting at Charleston, W. Va.

H. B. Lammers and A. L. Brown, chairman and executive secretary respectively, Coal Producers' Committee for Smoke Abatement, pointed out that the combination of man-made pollution and industry-created smoke and fumes made the Kanawha Valley problem especially hard to solve. They also warned that air-purification costs for some plants would be high.

The report recommended that the program be set up on a voluntary basis and that results be reviewed at one-year intervals for several years before setting up a mandatory program.

If Your Copy of Coal Age Was Late in Arriving . . .

The Editors sincerely regret any delay you may have experienced in receiving this issue, which is to be attributed to the disruption of mail schedules as a result of railroads cancelling trains because of coal shortages. We shall continue to make every effort to get COAL AGE to you during the early part of each month, as is our regular practice under normal conditions.

51
YEARS

CUSTOM-ENGINEERED
MINE CARS . . .

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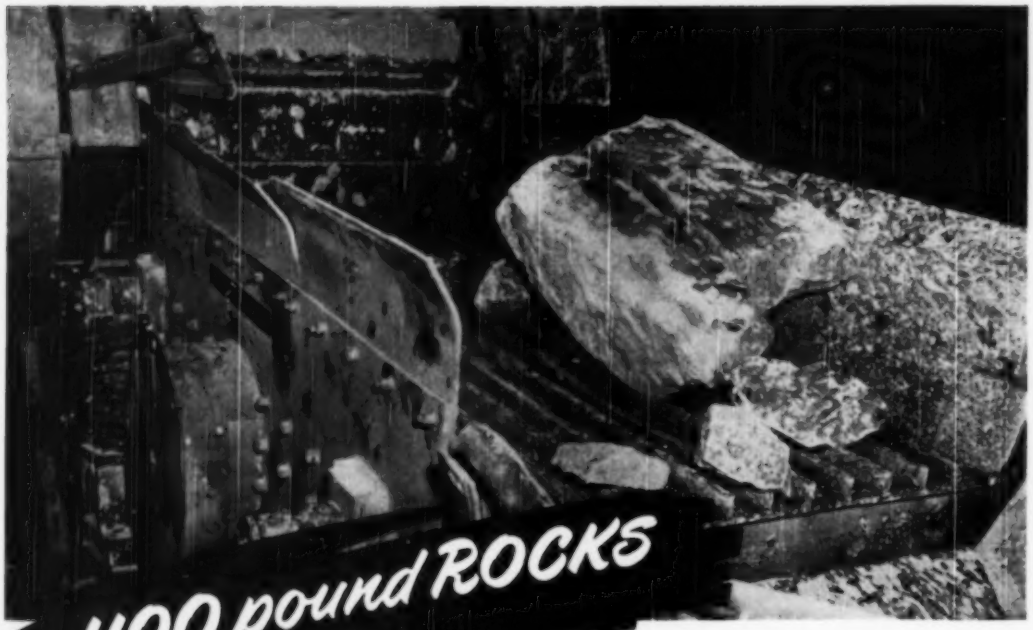

. . . Hewitt-Robins Vibrating Screens Process Them All!

Take a look at that big brute of a machine. It's a vibrating screen—a Hewitt-Robins Heavy Duty Scalper.

The big rock you see on its deck is a 3′ x 2′ x 1½′ lump of ore weighing about 1100 pounds. The Scalper handles loads like this at 1000 tons an hour. Yet, it absorbs those loads—and its own vibration—so completely that a coin placed on edge on the base beams will stand up without toppling over *while the machine is running!*

The same company that makes this big brute also makes a small screen called a Ceramic Slip Lawn. This lawn is so precise in action, so effective in operation, that it finds and removes tiny specks of impurities—about ½ pound in every ton of material—from clay slip for pottery plants.

Think of that range—from 1100 lb. rocks to tiny specks! It's the best proof of all that Hewitt-Robins can satisfy *your* vibrating screen demands!

Just look at these facts: Hewitt-Robins originated the circle-throw principle for vibrating screens. Hewitt-Robins created the elliptical throw. Hewitt-Robins pioneered in both 4-bearing and 2-bearing vibrators. Hewitt-Robins introduced the full-floating principle of vibration-absorption.

Whatever you want in vibrating screen equipment, you can *safely* rely on Hewitt-Robins. Tell us your needs; we will supply the answer. Write to Robins Conveyors Division, 270 Passaic Ave., Passaic, N. J.

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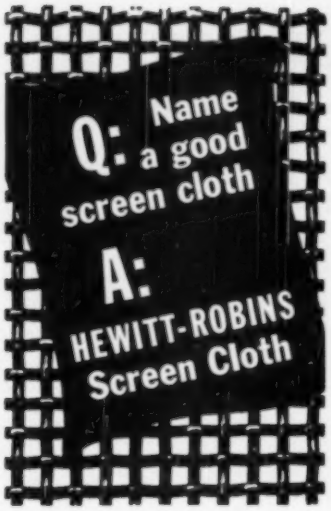

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SCREEN CLOTH

NCA Launches "Grass Roots" Drive in New Approach to Coal's Public Relations

A sweeping new campaign to tell the facts about coal and union monopoly powers to the people back home now is under way and will be extended in the months ahead. In a departure from former policy, Bituminous Coal Institute is taking an aggressive role in publicizing the issues and problems currently facing coal. These facts were revealed to nearly 200 coal-industry leaders who converged on Washington, D. C., Feb. 2, for a special meeting of the National Coal Association.

Growing out of the need for firmer public relations, the drive will use subject matter and methods that will create an integrated industry-wide movement geared to critical industry issues. This, it was pointed out, will be something new for coal and BCI. The campaign will enlist the participation of individual coal operators and local associations in their own areas and will aim, among other things, at passage of legislation resembling the pending Robertson bill.

"This is a grass-roots program. If you think it is good and if you want it, take it home with you and put it to work there," said John D. Battle, NCA executive vice president. Besides Mr. Battle, other leading figures in presenting the program were R. H. Knode, NCA president and president, Stonega Coke & Coal Co.; Fred S. McConnell, chairman, board of directors, BCI, and president, Enos Coal Mining Co.; and Ralph Mulligan, director, BCI.

Materials now available for distribution among individual operators and associations to help spread the industry's message were displayed and distributed by Mr. Mulligan and his aides. They included, among other items, newspaper and magazine advertisements proposed for national distribution and adaptable for local advertising, recorded interviews and spot announcements for radio broadcasting, ads for local newspapers to tell the facts about community losses chargeable to strikes and slowdowns, ads to be sponsored by local chambers of commerce, sample letters to newspaper editors with suggested news stories and editorials, letters and postcards designed for mailing to employees and a kit of materials to be used in speeches covering coal-supply shortages, union monopoly, the "able and willing" clause and the welfare fund.

"If you need help in your local program or in your association, NCA will send a staff member to work with you if you ask us," Mr. Battle announced.

Comments from the floor left no doubt that the program had the approval of NCA members present. Besides expressing their approval, their comments took the following general lines:

1. The miners themselves must be the starting point of good public relations. A friendly feeling must be developed between them and management that will reach all the way to top officials. Unhappy in their pres-

30-Yd Dragline Strips 85-Ft Overburden

SHOWN IN OPERATION stripping more than 85 ft of overburden for the Powhatan Mining Co., near Bloomingdale, Jefferson County, Ohio, this Marion 7800 dragline is said by the manufacturer to be the largest-type walking dragline in the world. The machine weighs 1,400 tons and is equipped with a 30-yd bucket and a 200-ft boom. The Pittsburgh No. 8 seam, 4½-ft thick, is being mined.

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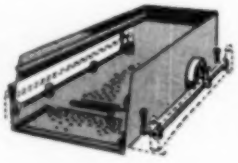
John Hockersmith, Manchester, Ky.

THIS SECO SINGLE DECK SCALPER QUICKLY TAKES OUT LUMP COAL

Here's another fine example of Seco performance on the job. The single deck, 12 ft. Seco pictured above is handling about 120 tons per hour of coal. Mr. Hockersmith reports that it takes the load as fast as the conveyor can feed it and does an excellent job of scalping. Many of the lumps that hit the screen weigh fifty pounds or more; yet, with this day after day beating, this Seco screen has required no maintenance. It runs as smooth as silk.

Seco Advanced Engineering makes the difference in performance

The cutaway illustration to the right shows the patented Equalizer Assembly. This is where Seco controls the true circular motion of the screen for smoother operation, greater tonnages and accurate sizing.



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ent plight, miners are receptive to information about the causes and effects of strikes.

2. Mine foremen and coal salesmen can be enlisted in the drive to broadcast the facts among miners and coal's customers.

3. Storekeepers and other business men, even in mining towns, do not know the real facts in the issues. They should be enlightened.

4. Local advertising agencies, who know the techniques of getting facts across to the public, can be used to good effect by individual companies and local associations that join in the campaign.

5. There is a big need for more pro-labor laws and fewer pro-labor-leader laws. The pending Robertson bill is an example of the kind of law needed to give workers a better break.

6. Spokesmen from industries that depend on coal, such as steel and automobiles, could be helpful in the drive.

7. Each company and local association should set up its own organization to effect this campaign locally.

8. Senators and representatives in Congress are eager for expressions of opinion from their constituents. Every coal operator should make his opinions known on current issues.

9. Opportunities for better state laws should not be overlooked. The Valentine anti-trust law in Ohio is an example of what can be done on the state level.

Coal men attending the meeting were urged to cash in on their presence in Washington by going straight to Capitol Hill after the meeting and talking with their representatives.

•

AMC Coal Convention Program Takes Shape

The fundamentals of modern coal mining will be the theme of the 1950 Coal Convention, American Mining Congress, to be held in Cincinnati, Ohio, Apr. 24-26. The program, already worked out in most details, will include the following:

Monday, Apr. 24—

Improved Public Relations—speaker to be announced.

Educational Programs to Develop Supervision—H. C. Livingston, Union Pacific Coal Co.; H. L. Walker, University of Illinois; G. R. Spindler, West Virginia University.

Symposium on Roof Bolting—Prof. P. B. Bucky, Columbia University; H. S. Jamison, Delmont Fuel Co.; Sterling S. Lanier Jr., Norton Coal Co.; D. E. Ingersoll, Philadelphia & Reading Coal & Iron Co.; Dr. T. H. Troller, Joy Mfg. Co.; and Edward M. Thomas, U. S. Bureau of Mines.

Analysis of Power Requirements for Strip Operations—Maurice Quinn, Sinclair Coal Co.

Grounding 440-V Circuits—L. W. Briscoe, Ayrshire Collieries Co.

Seismic Effect of Heavy Overbur-

JONES DRIVES for the coal industry

IF you have problems involving the application of speed reducers and other transmission products to belt and scraper conveyors, bucket elevators, feeders, railroad car dumps, loading booms and similar services, we believe you will be interested in the Jones bulletins and catalogs listed below.

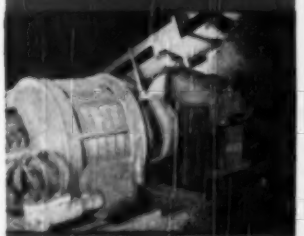
This technical literature plus a vast amount of data in our files cover most of the drive problems likely to be encountered in the production and preparation of coal.

The accompanying illustrations show some typical applications of Jones drives in leading mechanized mines in Southern Illinois. In the preparation plants of Bell & Zoller Coal Mining Company, Peabody Coal Company, Pyramid Coal Corporation and the United Electric Coal Company, Jones drives are extensively used. At the Ziegler preparation plant of Bell & Zoller, for example, some 25 Jones speed reducer units ranging from 5 Hp. to 100 Hp. are in service.

In every coal mining field you will find Jones drives standing up under the severest punishment of present day production schedules. We believe you will want to know more about how and why these drives can "stand up and take it." A line from you will bring any of the bulletins or detailed information on any drive problem that you may have

A Jones speed reducer, driven by 10 Hp. V-belt drive, on a raw coal system conveyor belt at Horse No. 47 preparation plant of the Peabody Coal Co.

A Jones speed reducer, ratio 38.1 to 1, or 1165 r.p.m. on 1, 10 Hp. motor through a V-belt drive at Horse No. 47 mine preparation plant of the Peabody Coal Co.



A 150 Hp. motor driving through a drive of one of the properties of the Bell & Zoller Coal Mining Co.

ANY, OR ALL, OF THESE JONES CATALOGS WILL BE SENT ON REQUEST

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No. 68—Jones Worm Gear Speed Reducers
No. 55—Jones Spur Gear Speed Reducer Units
No. 68—Jones Lemley Friction Clutches
No. 38B and 76—Jones V-Belt Sheaves
No. 78—Jones Flexible Couplings (4 pages)
No. 56—Jones Roller Bearing Pillow Blocks
No. 68A—Jones Cast Iron Pulleys

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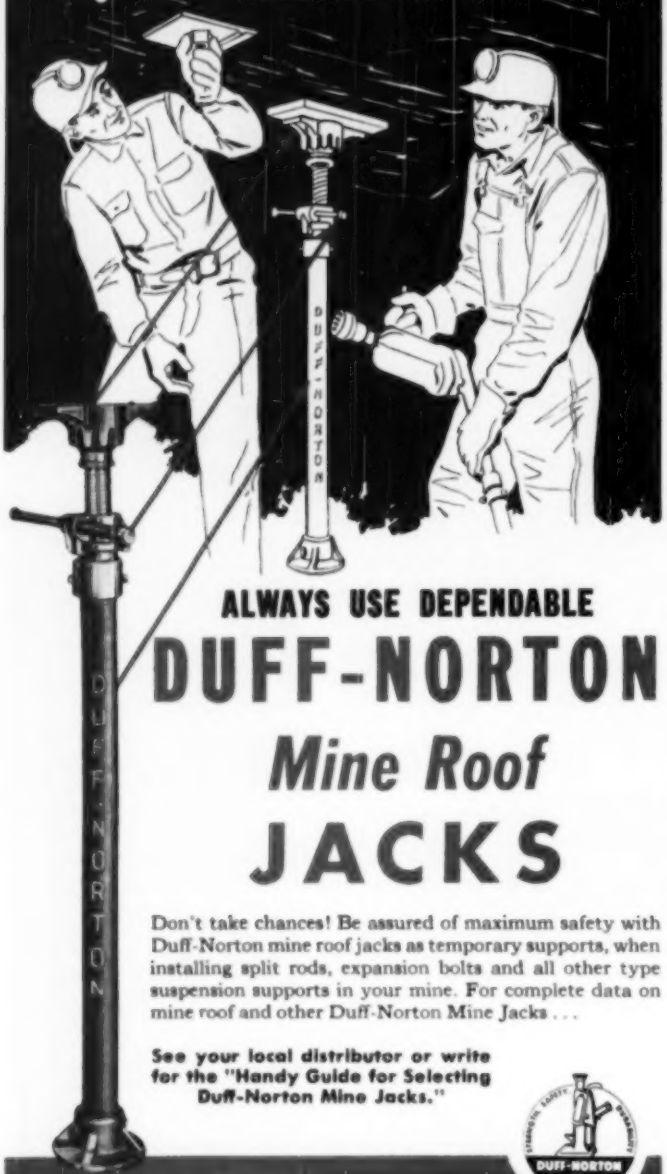

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den Blasting—Dr. L. Don Leet, Harvard University.

Radio Communications in Strip Mining—L. W. Barco, United Electric Coal Cos.

Tuesday, Apr. 25—

Symposium on Drying Fine Coal—F. P. Calhoun, Rochester & Pittsburgh Coal Co.; F. R. Buckley and George Land, West Kentucky Coal Co.; L. O. Lougee, Geo. S. Baton & Co.; F. C. Menk, Island Creek Coal Co.; C. D. Rubert, Lehigh Navigation Coal Co.; R. L. Sutherland, Truax-Traer Coal Co.

Panel Discussion on Mine-Accident Reduction—J. J. Forbes, U. S. Bureau of Mines; R. J. Howell, Glen Alden Coal Co.; A. D. Sisk, Kentucky Department of Mines; C. R. Stahl, Eastern Gas & Fuel Associates; and others to be announced.

Power Controls for Belt Conveyors—George T. Atkins, Barnes & Tucker Corp.; and W. R. Roberts, Jeffrey Mfg. Co.

Use of AC Power for All Underground Operations—J. O. Cree, West Virginia Engineering Co.; and David Stoetzel, General Electric Co.

Modern Mine Haulage With Belts and Tracks—George M. Rigg, Weirton Coal Co., and G. F. Leatherman, Inland Steel Co.

Results of Time Studies in Improving Operating Efficiency—J. K. Berry, Consolidation Coal Co. (Ky.); A. W. Asman, Pennsylvania State College; and others to be announced.

Maintenance of Mining Equipment—George L. Judy, Consolidation Coal Co. (W. Va.).

Use of Voltages Higher Than 4,000 for Large Equipment—J. E. Borland, Westinghouse Electric Corp.

Wheel Excavator for Overburden Removal—John J. Huey, United Electric Coal Cos.

Measurable Advantages of Outside Curves—Lafe Stewart, Maumee Collieries Co., and R. M. Dickey, Bucyrus-Erie Co.

Wednesday, April 26—

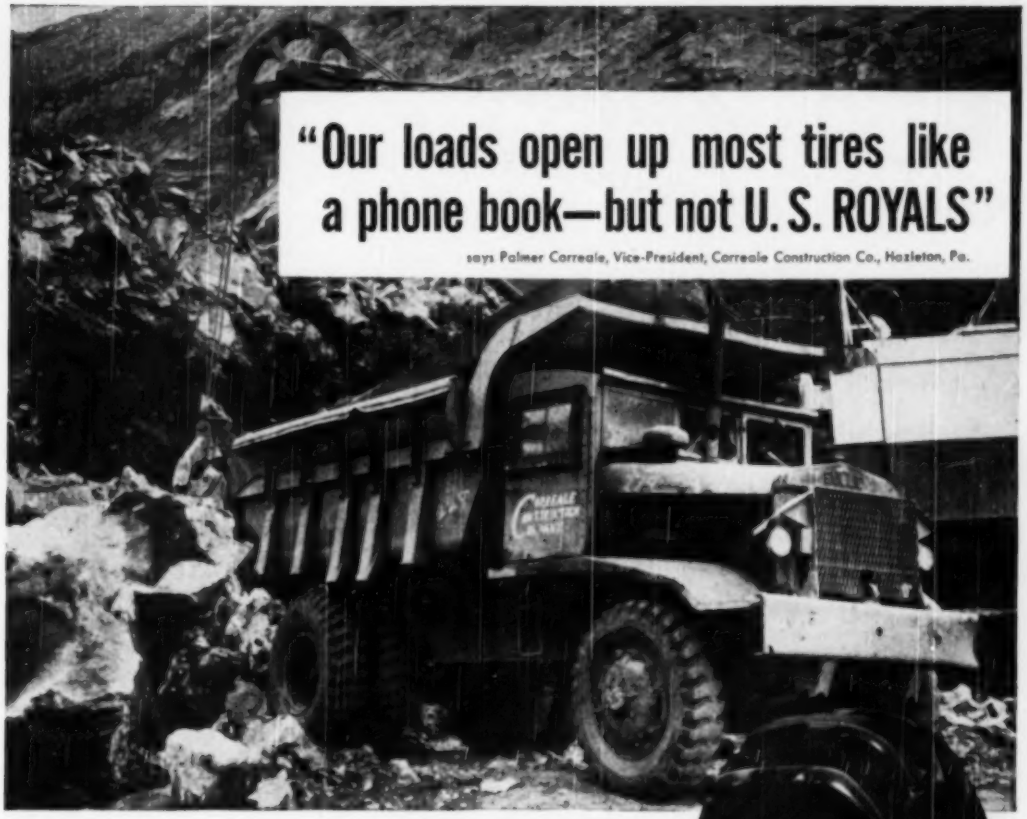
Essentials of a Sound Pension Plan for Company Employees—J. W. Meyers, Standard Oil Co. (N. J.); R. C. Edlund, Fred Rudge, Inc., and others to be announced.

European Trends in Coal Cleaning—John Griffen, McNally-Pittsburg Mfg. Corp.

Latest Developments and Trends in Coal Preparation—A. C. Richardson, Battelle Memorial Institute.

Preventing and Extinguishing Fires in Surface Gob Piles—Henry F. Hebley, Pittsburgh Consolidation Coal Co., and E. T. Powell, Susquehanna Collieries Co.

Continuous Mining Symposium—W. E. Hess, Jones & Laughlin Steel Corp.; W. J. Phillips, Sunnyhill Coal Co.; M. F. Cunningham, Goodman Mfg. Co.; R. M. Hunter, Rochester & Pittsburgh Coal Co.; C. E. Hugus Jr., Reliance Electric & Engineering Co.; Gerald Von Stroh, Mining Development Committee, BCR; and others to be announced.



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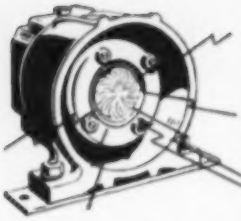

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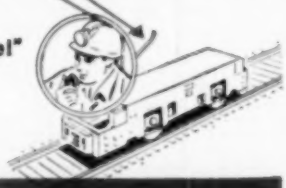

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AIME Coal Division Meet

(*Continued from p 150*)

Good maintenance requires effective training, a staff position for the chief maintenance engineer, and proper tools, according to R. M. Hunter, electrical engineer, Rochester & Pittsburgh Coal Co. Problems of the maintenance department should be considered when purchase of new equipment is discussed and planned, Mr. Hunter said. He also stated that management must promote training programs to have the type of maintenance men required to keep present machines in service.

Prevention of mine fires, dust control in the anthracite region and mine safety in West Virginia were discussed at the Monday afternoon session by F. J. Peternell, safety engineer, Union Pacific Coal Co., Rock Springs, Wyo.; R. E. Doherty, research engineer, Anthracite Institute, Wilkes Barre, Pa.; and A. J. Alexander, chief, West Virginia Department of Mines, respectively. C. M. Donahue, Mine Safety Appliances Co., and R. H. Swallow, Ayrshire Collieries Corp., were associate chairmen.

Good housekeeping, proper installation and maintenance of electrical equipment and complete preparation for fire fighting are necessary to prevent fires or limit their damage, Mr. Peternell said. Also, good ventilation in active works and worked-out areas is necessary to prevent spontaneous combustion in coals exhibiting this tendency. Sectionalization of large mines to isolate fires to one section for more effective fighting of the fire was suggested by Mr. Peternell.

Employee training and simple dust-control devices are necessary for effective control of siliceous dusts, Mr. Doherty said. He contended that men will not take time to use complicated systems or devices that become blocked frequently. However, they demand dust control after working in a dust-free place for a short time, so acceptance depends on proper introduction of the system and good initial training of the workmen.

Training occupational groups in the hazards of their respective jobs will be undertaken by the West Virginia Department of Mines, according to a plan outlined by Mr. Alexander. Closer adherence to known safety rules, more rigid roof-control discipline and closer supervision on safety matters are required to reduce accidents among workers in the high-fatality occupations such as haulage brakemen, machine runners and hand loaders.

Fine coal cleaning was discussed at the opening session of a symposium on the subject on Tuesday morning, with W. Julian Parton, Lehigh Navigation Coal Co., and Donald N. Griffin, Deister Concentrator Co., acting as co-chairmen.

Test results in cleaning bituminous fines on concentrating tables were pre-

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Here are reasons why. Battery cars produce 22% more tons per shuttle car hour. They travel 25% faster . . . discharge 30% faster. They produce more tons per man shift. They're completely maneuverable and can travel any route.

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Equal capital cost
Produce coal in shuttle car sections for approximately ½c less per ton* —in hand-loaded sections, as much as 75c a ton

*Shuttle Car Haulage, AIME, Technical Publication No. 2198.

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sented by R. E. Zimmerman, chief, Mineral Preparation Division, Pennsylvania State College. Mr. Zimmerman reported on washability studies conducted on representative samples of Ohio, Pennsylvania and Alabama coals. Factors affecting separation on concentrating tables and table characteristics that control the process were outlined.

Progress in applying Dutch State Mines cyclone separator to the field of fine coal preparation was discussed at this session by S. A. Falconer, mineral dressing engineer, American Cyanamid Co., Stamford, Conn. Development of the process, operating principles of the separator and results of analyses of anthracite and bituminous fines at the company's pilot plant in Stamford were reviewed by Mr. Falconer.

Use of the cyclone as a thickener for clarification of washery water and recovery of fine coal from the plant bleed was the subject of a paper presented by M. G. Driessen, consulting engineer, Pittsburgh, Pa. The paper was prepared by Mr. Driessen and H. E. Criner, development engineer, Heyl & Patterson Co. Performance data for different sizes of cyclones were presented, and the operating characteristics of the cyclone as a thickener were outlined by Mr. Driessen.

Fine coal cleaning, theme of the morning session, was continued with three papers at the Tuesday afternoon session, with R. E. Zimmerman, Pennsylvania State College, and Nelson L. Davis, Nelson Davis Co., presiding jointly.

Kerosene flotation for cleaning fines for metallurgical use at two Alabama mines was described by L. E. Schiffman, Sloss-Sheffield Coal & Iron Co., Birmingham, the first speaker at the Tuesday afternoon session. At the Bessie mine, sludge is previously washed in the jig plant and fines are removed in the settling tank before going to the flotation plant. At the Kimberly mine, raw coal is fed to the flotation plant.

Advantages of the raw-coal feed at Kimberly are as follows, Mr. Schiffman stated: (1) retention of fine coal, (2) greater capacity in the jig and (3) better jig performance. Top satisfactory capacity lies between 12 and 20 tph. Investigations aimed at increasing cell capacity have included supercharging, changing impeller speed, increasing the area covered by raking, and conditioning, but the only practicable system proved to be a change in the raking mechanism to cover an active cell area 2.3 times as large as the standard mechanism does. This has increased capacity about 7%.

The reagent used in both plants is kerosene with no additions, Mr. Schiffman reported. The kerosene process produces a floated coal that can be dewatered readily to about 25% moisture in a simple dewatering screw. However, the effectiveness of separa-

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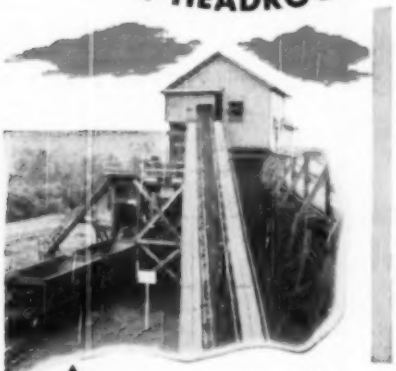

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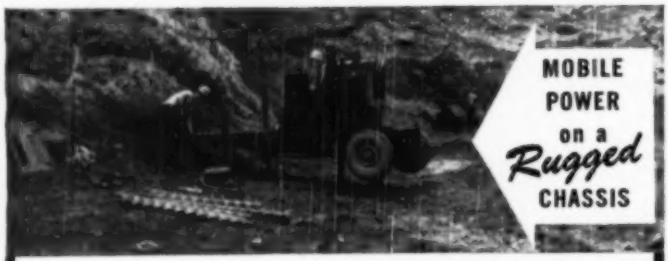

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tion becomes poorer on sizes below about 200 mesh.

The Humphreys Spiral as a cleaner of fine coal was discussed in a paper prepared by H. F. Yancey, M. R. Geer and C. L. Allyn, U.S. Bureau of Mines, Seattle, Wash., and R. H. Eckhouse, research fellow, University of Washington. Mr. Yancey presented the paper.

Stressing the simplicity of the spiral—absence of moving parts, simplicity of operation, and construction from unmachined castings—Mr. Yancey described extensive tests of the effectiveness of the spiral on four coals: the Clements bed in Alabama, the No. 9 bed in Kentucky, the Pocahontas No. 6 bed in West Virginia and the Roslyn bed in Washington.

The washed products were examined by float-and-sink and screen-sizing tests to determine the mechanics of the separation between coal and impurity, Mr. Yancey reported. The spiral performed equally well on all four coals. Little clean coal coarser than 28-mesh or finer than 100-mesh was lost but considerable coal of intermediate size was drawn off through the refuse ports. That situation points to the possibility of re-treating a combined refuse-middling product to provide maximum efficiency. It also stresses the higher efficiencies to be obtained with a classified or semi-classified feed rather than with raw coal.

Rheolaveur launders are used in the United States to treat a wide range of fine sizes from ½x0 in to about ⅛x0 in, said John Griffen, McNally Pittsburg Mfg. Co. In Europe, the range is even wider, running from ⅝x0 in to minus 28-mesh, he added. Capacity of these launders is high, they require little building space per ton of input and maintenance costs are low. Some units are known to have operated up to 20 years without major replacement.

However, when compared with hand-loaded coal, the dirtier machine-loaded coal has a measurable unfavorable effect on Rheolaveur operation, Mr. Griffen said. Even so, Rheolaveur units can readily produce a first-grade coal for specific uses and a second-grade product for sale as steam coal or mine power-plant fuel. In West Virginia, for example, a Rheolaveur plant makes a high-grade coking coal as a first-class product and a 12.5 to 14% ash coal suitable for power-plant use.

Measuring plant efficiency by generally accepted methods does not always indicate true efficiency, declared W. W. Anderson, Commercial Testing & Engineering Co. Mr. Anderson's paper was the lead-off address at the Wednesday morning session, with Byron Bird, Jeffrey Mfg. Co., and E. C. Carris presiding jointly.

Mr. Anderson proposed a new formula for measuring cleaning-plant efficiency. The formula, based on the concept of misplaced material at the

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Translated into per-ton cost figures, these records showed that bronze screens cost .0022¢ while Stainless Steel screens cost .0009¢—less than half as much.

But long life and resulting low cost are only two of the advantages of using Stainless Steel screens. Stainless screens resist corrosion and remain in good condition even in intermittent operation. They reduce "blinding" because perforations remain clean and smooth. They maintain correct perforation size longer than screens made of other materials. Because Stainless is so strong and tough, screens can be made thinner and lighter.

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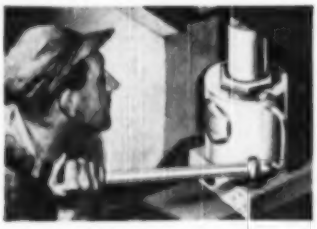

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gravity of separation, is as follows:

> Quantitative efficiency = 100% — (percent weight of sink in cleaned coal + percent weight of float in refuse).

The significance of this formula, Mr. Anderson declared, is that separation must be made before the formula can be used, that improperly distributed materials must be determined at the gravity of separation instead of some arbitrary test gravity and that the formula requires no knowledge of feed into the plant.

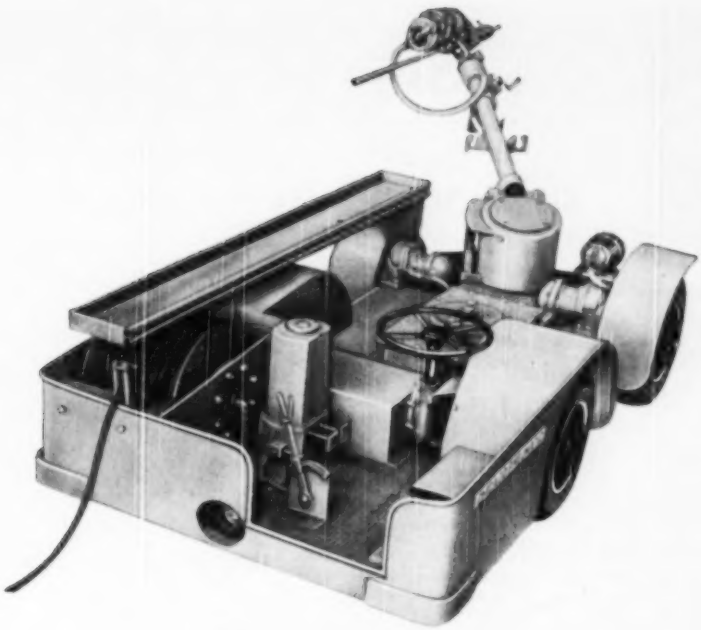
Bird Centrifuge operation was described in a paper by A. C. Richardson, Battelle Memorial Institute, and Orville R. Lyons, Heyl & Patterson, Inc. Mr. Richardson, who read the paper, summarized dewatering operating data obtained at one plant in an investigation of (1) percentages of solids in centrifuge feed, cake and effluent and the plant circulating water and (2) screen-sizing of centrifuge feed, cake, effluent and cake-effluent samples. At this plant, the feed was minus ¼ in in the form of a pulp of approximately 38% solids. With this feed, the plant had the following characteristics: (1) cake moisture was about 15%, (2) effluent solids varied from 1.5 to 5.5% by weight with a gradual increase throughout most of the sampling period and (3) moisture content of the cake varied considerably with the percentage of minus 150-mesh and minus 200-mesh solids in the feed.

From these data, Mr. Richardson concluded that plant designers should consider the effect of the performance of any one unit on plant operation. He urged equipment builders and coal operating men to consider these data, remarking that use of a fire hose to provide needed water, as was found necessary in the plant described, is no substitute for good planning and engineering.

F. K. Ferney, Bird Machinery Co., commenting on the Richardson-Lyons paper, pointed out that sampling methods and other procedures used in gathering the data were open to some question.

Fine-coal drying methods worked out by the U.S. Bureau of Mines experimental station, Denver, Colo., give promise of better utilization of low-rank western coals and may provide raw materials for a synthetic liquid-fuels industry. That was the inference to be drawn from a paper by V. F. Parry and E. O. Wagner, U.S. Bureau of Mines, Denver. Mr. Parry presented the paper.

Earlier dryers for low-rank fine coals failed to drive out bed moisture and were characterized by danger of explosion, Mr. Parry declared. Experimental pilot plants of new design at Denver now dry fine coal in a fluidized bed without danger, reducing bed moisture from 23.2%, for example, down to 3.7% and from 48% down to 20%. Capacity of these plants ranges from 700 to over 2,000 lb per square



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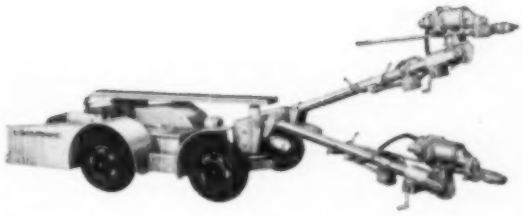

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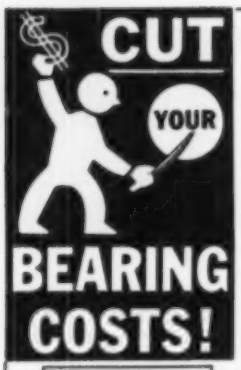

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foot of bed area and thermal efficiency approaches 90%, he added. Results of the drying are higher Btu content per unit of weight, much lower moisture, a slight increase in ash content and some degradation in size.

The dried coals, however, pack well up to 45 deg slope and handle easily through pipes and orifices. The product, which reabsorbs moisture if unprotected, must be shipped in closed containers, he warned.

Men and machines abroad was the theme of the Wednesday afternoon session, E. R. Price, Inland Steel Co., Mr. Mitchell and Mr. Yancey presiding successively.

Speakers on mining abroad were the following: Mr. Griffen; J. W. Woomer, J. W. Woomer & Associates; W. W. Dartnell, Hillman Coal & Coke Co.; H. F. Hebley, Pittsburgh Consolidation Coal Co.; Clayton G. Ball, Paul Weir Co.; R. R. Estill, U. S. Coal & Coke Co.; Thomas Fraser, U. S. Bureau of Mines; Mr. Bird; and Ray S. Bigelow, Goodman Mfg. Co.

Speaking of England, Mr. Griffen pointed out that considerable American preparation equipment is used in that country. The big problem there is to bridge the gap between older installations and the long-range target of the National Coal Board—consolidation of preparation facilities into fewer plants of large capacity. British plants, he stated, are ahead of American plants in the following respects: (1) mechanical cleaning of large sizes to eliminate hand-picking; (2) use of heavy-media processes on difficult coals; (3) froth flotation for cleaning slurries; and (4) use of starch and other coagulants on the feed to thickeners for clarification of waste water and reduction of stream pollution.

Turning to Holland, Mr. Griffen explained that mining there is difficult and that run-of-mine coal is quite dirty, containing 30 to 35% reject. However, extensive research is going on in mining and preparation problems. This may result in new processes of comparable importance with heavy-media treatment, in which the Dutch have led the world.

In China, critical factors in the coal situation are the failure of transport, Russian stupidity in stripping mines and plants and equipment, and the failure of American-trained Chinese engineers to put their training to work, Mr. Woomer said. In Turkey, American-trained Turkish engineers are taking hold and can be counted on to exploit the nation's limited coal reserves to produce needed electric power. In Australia, Mr. Woomer reported, with the help of American engineers and a revision in their own thinking, Australians are beginning to appreciate their vast reserves of low-grade coals, which lie mostly in the west. In the east, American methods are fairly widely used, though a good many mines lag behind. But the bene-

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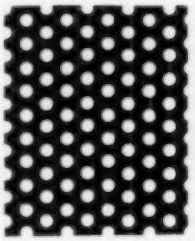

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fits of mechanization have not been passed on to workers, he stated.

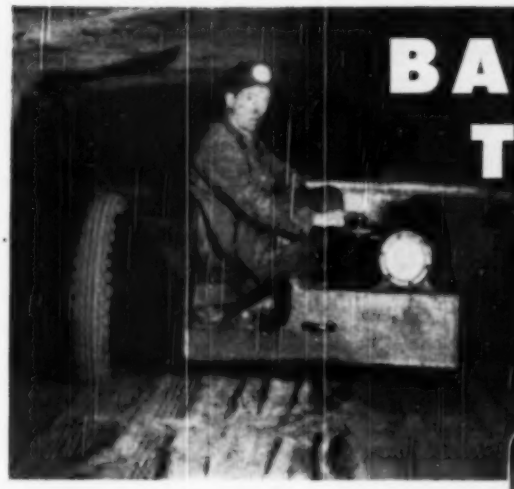
In France, mining conditions do not permit the use of big American machines on a wide scale, though the French have imported loaders, cutters, belts, chain conveyors, cap lamps, drills, blasting caps and other items, Mr. Dartnell said. The main problem in French productivity, which ranges between 0.6 and 2.0 tons per man day, is the excess of transport and surface workers employed. Face work, he pointed out, goes along very well, though mining conditions are difficult in most places. On the whole, the French are ingenious in solving their problems. For example, one mine has completely galvanized all its steel mine cars to protect them against water and another mine draws off methane from underground and uses it as power-plant fuel and, when compressed, as truck fuel.

Poland took the worst beating of all the countries in World War II and Russian ignorance of machinery has ruined much of Poland's industrial plant, Mr. Hebley declared. However, the Poles are working hard to get their economy going again and are starting extensive research projects. Manpower is extremely short and women and prisoners of war do much of the work in and around the mines. Most of Poland's coal, containing up to 35% ash and 15 to 20% moisture, goes to power plants. Under very difficult conditions, the Poles are solving their problems with ingenuity and skill. They work hard at their jobs and are interested in their work.

Chilean mining methods are primitive and production is limited mostly to supplying tramp steamers and meat-packing plants near the southern tip of South America, Mr. Ball reported. In this area, productivity is low and reserves are limited. Major reserves are northward, near Concepcion, but are largely undeveloped. Distances to markets are great and transportation is limited.

In Germany, mining conditions are similar to those in France. In addition, Hitler's prewar policies stalled mine mechanization, Mr. Estill declared. The Germans must contend with inclines, dips and faults, with great depths averaging 2,300 ft and with difficult roof conditions. They are hard-working, smart people, however, and are attacking their problems with courage. The longwall system prevails generally and engineers have developed new-type machines that are boosting output (*Coal Age*, December, 1949, p 70).

South American coal reserves are widespread but probably only Colombia, Peru and Chile have the variety of coals needed for development of a complex industrial economy, Mr. Fraser stated. Argentina is beginning to develop its coal reserves but meth-



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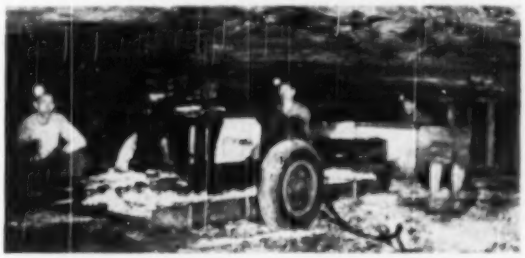

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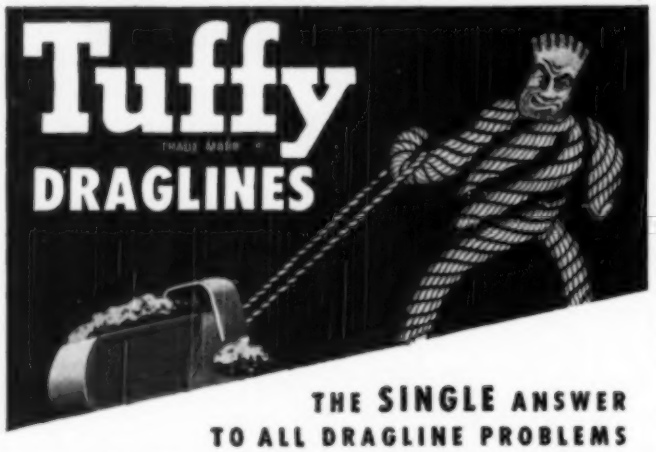

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ods are primitive and progress is slow. Brazil's coal industry is the oldest in South America and has been helped greatly by American methods, equipment and plants. Preparation is difficult because of slate and ash. Most of Colombia's coal output comes from small primitive mines but, in spite of the widest variety and largest reserves of coal in the continent, the government seems uninterested in developing a coal industry. Peru's reserves are scattered and mostly unexplored but some American equipment is used to supply small quantities of coal to restricted markets. Venezuela's coal probably will not be developed as long as the nation's economy is based on oil, Mr. Fraser concluded.

South Africa has vast reserves of coal but limited reserves of coking coal, Mr. Bird declared. However, deposits north of Johannesburg contain a 12-in band that can be blended to make a satisfactory coking coal for steel plants close by. Though most coal is screened and handpicked, mechanization is advancing because labor is growing scarce.

In India, coal production is rising slowly, though only 429 of the country's 973 mines have any power available, Mr. Bigelow said. Expected development of a hydroelectric system probably will speed mechanization. As it is, however, manpower is cheap and plentiful and equipment is primitive. For example, mine cars, wherever found, are small, and rail is never heavier than 20 lb.

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Bituminous Coal Research

(*Continued from p.* 150)

power use might well be worth considerable coal-industry effort.

Discussion following the paper brought out, with optimism as to the long-run future, definite declarations that more research is a necessity and a suggestion that if coal wants home units sold the producer will have to do it to really get results.

Stating that the bituminous markets, and especially the domestic market, are now in jeopardy, E. C. Perkins, manager of domestic sales, Appalachian Coals Inc., Cincinnati, analyzed recent developments and concluded that additional research is a necessity, along with a new program of active development and promotion of domestic-heating equipment—both old and new—by coal producers, equipment manufacturers and retailers. In discussion from the floor, it was contended that any such program also should include finding out what the customer really wants.

The point that coal must devote increased attention to development and promotion of equipment and methods if it is to get the maximum benefits from research was again made by Dr. H. J. Rose, BCR vice president and director of research, in

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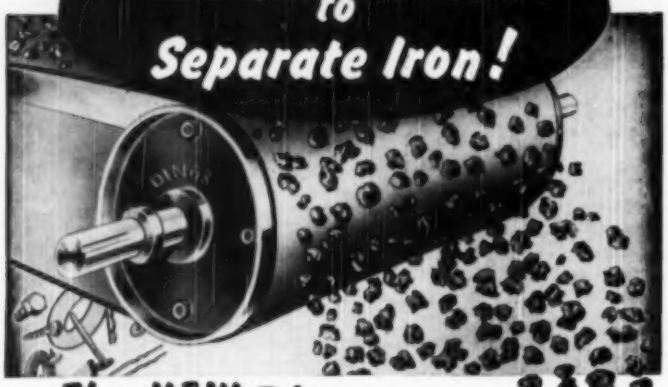

The NEW Dings
NON-ELECTRIC
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The new Dings PERMA-PULLEY is a revolutionary contribution to magnetic separation. You can install it and forget it!

Backed by 50 years of magnetic separator manufacturing experience, this new pulley offers these plus features that assure you of maximum tramp iron removal:

- Extra high strength grade of Alnico
- Closely spaced poles
- Magnetic strength equal across entire belt width
- Crowned face to prevent belt weave
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Dings PERMA-PULLEYS are available in 53 sizes with shaft diameters to suit your requirements. *ALSO* complete *pulley type separators with PERMA-PULLEY, idler pulley, belt and drive in any size required.* SEND for

*MOST POWERFUL NON-ELECTRIC PULLEY ON THE MARKET!

Dings offers you the most powerful magnetic pulleys for the job:

1. The Dings Perma-Pulley with extremely high surface strength and high penetrating power.

2. The Dings "High Intensity" Electromagnetic Pulley with greatest depth of penetration available from a pulley.

Both types of Dings Pulley are the most powerful on the market size for size.

DINGS MAGNETIC SEPARATOR CO.
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Dings
"HIGH INTENSITY"

MAGNETIC PERMANENCE GUARANTEED for life!

reviewing BCR accomplishments to date. Of the 36 projects selected for work five years ago, Dr. Rose reported 24 have been completed, with favorable results in 23. One six of those remaining work is continued. On the other six it has been stopped to permit concentration on others considered more urgent. In addition to the original 36 projects, 20 more were added since and work has been completed on 15, with unfavorable results in three. Of all the projects started 14 are now in actual commercial use, 15 have reached the field-test stage and five have reached the commercial-design stage.

"Opportunities for BCR and CHS Cooperation" were analyzed by J. Nelson Stuart, manager, Coal Heating Service Div., National Coal Association, at the luncheon session, with Mr. Davis presiding. CHS, said Mr. Stuart, can and has helped by getting retail dealers and manufacturers to take more interest in developing and merchandising coal-burning equipment. With the manufacturers, he declared, CHS experience "inclines us to the opinion that for the present our industry must carry more of the burden of product development of coal heaters to the point of commercial practicability than was considered necessary just a few months ago. When manufacturers see actual evidence of profit possibilities, they will undoubtedly once again take over a bigger share and in so doing will once more renew their interest in coal."

Emphasizing the intangible but none the less important by-products of coal research, Eugene D. Benton, director of research, Ohio Coal Association, opened the second technical session with a discussion of research and its relation to industrial and railroad markets, with Mr. Sherwood presiding. Outlining developments in the fields of improved gas producers, locomotive design, steam generation for industrial plants and smoke and fly-ash control, Mr. Benton pointed out that in addition to direct benefits the coal industry gains substantial intangible benefits by learning not only the problems and needs of consumers but also the problems and weaknesses and strength of competition. Thus, it gains useful data for advancing its own cause.

BCR is currently conducting research on 10 major projects of special interest to the retail market, declared Elmer R. Kaiser, assistant director of research, in outlining BCR service in the retail field. A major project was development of the principles of burning coal smokelessly and efficiently. These were incorporated in the Martin stove, manufacture of which has been started. Plans call for increased production and widespread sale in the 50-51 heating season. Other developments include successful adaptation of the smokeless principle to residential boilers and warm-air furnaces, and construction of a semi-production model bin-feed ash-removal stoker.

Progress in fundamental research

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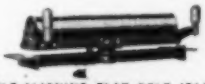

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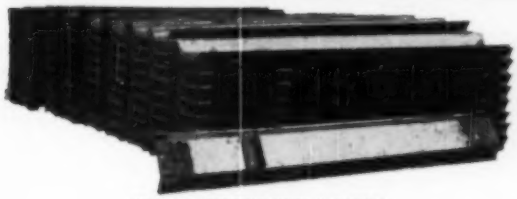

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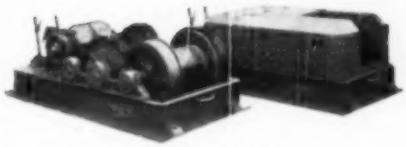
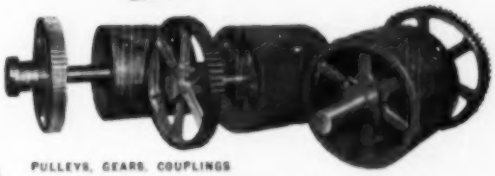


MINE CAR SPOTTING HOISTS

CG-4906B



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2. Belt conveyor hauling coal to tipple.

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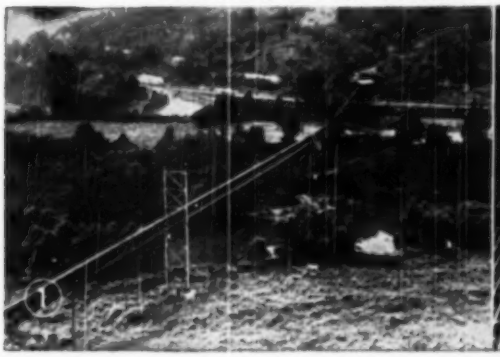

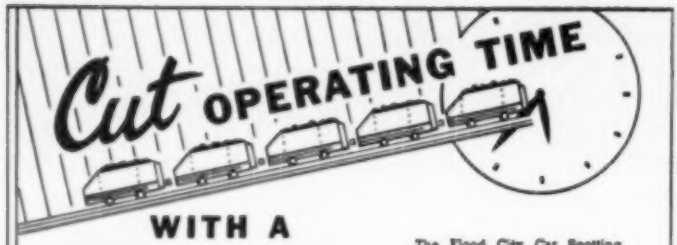

WITH A

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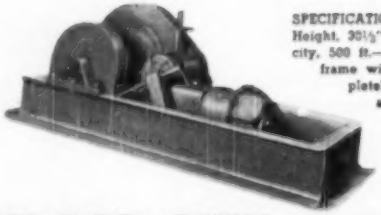

SPECIFICATIONS: Length, 7'; Width, 29½"; Height, 30½"; Weight, 2195 lbs.; Rope Capacity, 500 ft.—⅝", 750 ft.—½". Channel iron frame with solid steel bottom . . . completely guarded . . . all parts readily accessible.

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Ruberoid Insulating Tape does more than "patch" a cable splice—it strengthens it so that you can drag your cable *anywhere* with complete safety. Equally adhesive on *both* sides, it has an inter-bonded grip that holds the spliced cable with vise-like power. A leader in cable maintenance for more than half a century, only Ruberoid Insulating Tape gives all seven of these big features.

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to discover useful facts about the nature of coal, combustion, ignition characteristics, reactivity and so on was outlined by A. A. Orning, coal research laboratory, Carnegie Institute of Technology. Both in the paper and in supplementary discussion, it was brought out that research provides facts, and facts are necessary to arrive at a correct answer to a problem.

The coal industry can regain its position as the leading supplier of heat and power, even though it faces its most intensive competition at a time of rising production cost. The answer is in new and more efficient equipment and methods, declared Stephen Krickovic, chief engineer, Eastern Gas & Fuel Associates, and chairman, BCR mining advisory group, in opening a discussion of the work of the Mining Development Committee. Real progress has been made on development of a continuous mining machine that will materially reduce coal cost, and the industry also will benefit from collateral progress in face conveyor and bit design.

Reiterating the need for lower cost in the future, M. H. Forester, vice president, Pittsburgh Consolidation Coal Co., and A. B. Crichton Jr., vice president, Johnstown Coal & Coke Co., pointed out that the new machine apparently will meet all the major standards set up as a result of a survey of subscriber needs.

Remarking that it is always darkest before the dawn, Julian E. Tobey, president, Appalachian Coals, Inc., Cincinnati, declared that the coal situation is no more hopeless now than at other times in the history of the industry, and that hard work, courage, determination and promotional ability will see the industry through. Competition has some problems, too, and coal is favored by at least six factors: (1) It is a basic energy source, (2) coal is a basic metallurgical material, (3) coal must be supported and encouraged for security reasons, (4) the railroads will return to coal—and perhaps sooner than might otherwise be the case for security reasons, (5) domestic consumers may run into bad luck with other fuels, and (6) most steam generating plants will be operated by coal. More research equipment development and promotion is, however, a necessity.

The French coal industry also has encountered difficulties, especially in the domestic and railroad markets, and consequently has embarked on a research program also, declared P. L. Schereschewsky, Charbonnages de France, Paris, in concluding the meeting. A new research center has been built and research activities are being supported by a levy of 3c per ton, plus some additional funds for special projects. He expressed the hope that the French and United States organizations could work out a means of cooperation.

Photo courtesy The Jeffrey Manufacturing Company

how Alemite helps you CUT MINING COSTS

WITH MECHANIZED LUBRICATION METHODS!

In shaft or strip mining, coal dust and dirt are the worst problems you face in maintaining expensive equipment.

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Above or below ground, Alemite pumps can be powered with air or electricity, to suit your individual needs. Modern Alemite methods assure positive lubrication for your mine cars and machinery. You get more trouble-free operation at minimum cost per hour!

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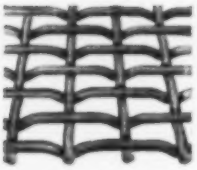
Alemite Cuts Costs 3 Ways...

1. In Transferring Lubricants . . . by eliminating mess, expensive contamination – and cutting man-hours 63% for every 100 pounds of lubricant transferred.

2. In Loading Grease Guns . . . by saving 3¼ man-hours for every 100 pounds of lubricant loaded into hand guns.

3. In Applying Lubricants . . . by saving up to 23.9 man-hours for every 100 pounds of lubricant applied to bearings.



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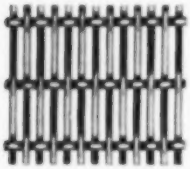

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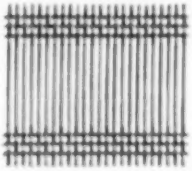

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Mail coupon below for information that may help improve your screening operations.

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A CENTURY OF CONFIDENCE

School Mining Courses Planned for W. Va.

Progress in setting up coal-mining instruction in selected high schools throughout West Virginia was reported Feb. 8 by H. K. Baer, chairman of a state committee which is studying the subject and arranging for inclusion of such instruction in the curriculum. A tentative course of study is to be prepared by two subcommittees, which are to report at a meeting of the group April 26.

The committee hopes to have the study course outlined in time to provide special teacher training courses this summer, Mr. Baer reported. Teachers receiving this training, which would be given at West Virginia University and West Virginia State College, would offer the coal-mining training on a tentative basis in their schools next fall. The instruction would involve two major phases. For all grades through junior high school, present courses would be expanded to emphasize the importance of the industry to the state and to acquaint students generally with the industry and its opportunities. In the high schools, a special optional course would provide a detailed background for boys interested in the field. The course would concentrate on theory and observation rather than on technical details.

A committee of coal operators, miners and members of the county board of education in Wyoming County, West Virginia, also are working on plans for a complete course in coal mining in the county's high schools.

The committee, which met Jan. 21 at Pineville, estimated that 74% of the high-school graduates in West Virginia earn their living directly or indirectly from coal mining and that 78% of all salaries in the state are paid in one way or another by the coal industry.

Recommendations of the committee urged that: (1) the course be opened only to those who show an interest in coal mining or a need for training; (2) courses should be elective; (3) training should be done by textbooks and classroom methods; (4) the state board of education should help in planning and administering the course; (5) a list of source materials should be included in the course; and (6) members of the local county committee on coal managing should be kept informed on developments.

•

Oil Is Held Ample For All Demands

The United States has enough oil to meet "all demands of the foreseeable future," according to a report submitted Jan. 26 to the Department of the Interior by the National Petroleum Council. The report declared that there is a reserve production

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We call our new core drill the "Teredo" because it will out-bore any other machine of its size. This light, compact, portable core drill will recover cores up to 2⅛" in diameter and operate at depths to 600'. It can be mounted on drag skids, jeep, truck or trailer; and powered by air motor, electric motor, gasoline or diesel engine or truck take-off. It's simple, rugged and relatively inexpensive.
Either mechanical screw feed or hydraulic feed can be furnished. Send for Bulletin 30CA.

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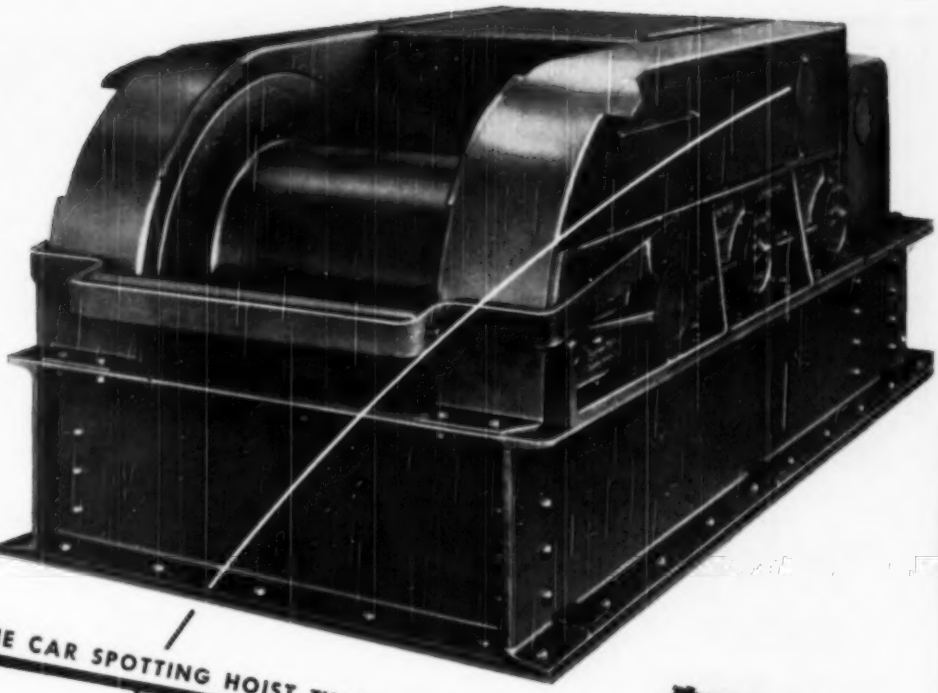

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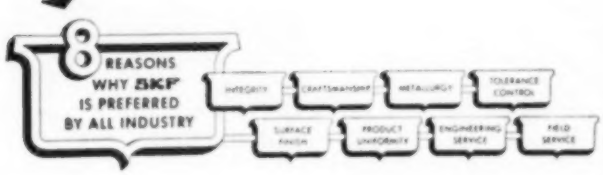
. . . AND IT'S SKF-EQUIPPED

Model HKR Car Spotting Hoist, made by Brown-Fayro Company, Johnstown, is compact, sturdy and plenty powerful. It's rated at 18,000 lb. normal rope pull at 35 fpm. . . . equivalent to the drawbar pull of a 40-ton locomotive. Intermediate shafts are carried on SKF Self-Aligning Ball Bearings. That's a wise choice . . . but it's only natural. Time and again, SKF Bearings have demonstrated their complete dependability and efficiency under the toughest, most trying kinds of operating conditions. Reason is . . . SKF Bearings are designed, engineered and made by men who pioneered the Self-Aligning Ball Bearing. They're manufactured to rigid standards of craftsmanship . . . meticulously inspected . . . packed to reach the user in the same "final inspection" condition they left the plant. SKF Engineers are always anxious to work with you in designing for maximum efficiency and economy.

SKF Industries, Inc., Philadelphia 32, Pennsylvania. The Pioneers of the Deep Groove Ball Bearing – Spherical Roller Bearing – Self-Aligning Ball Bearing. 7076



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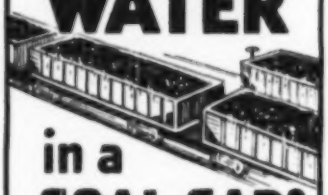

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—will turn your slurry and "wet coal" liabilities into assets and . . . profits.

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capacity of 700,000 bbl daily and that this reserve capacity soon may be increased to 1,000,000 bbl.

In case of war, the council pointed out, 2,000,000 bbl daily could be made available if civilian rationing were imposed.

"In view of this, there appears to be no need for commercial-scale production of liquid fuels from coal or shale in the next few years," the report said. The council estimated that at least 100,000,000,000 bbl of usable liquid products may be obtained from either the coal or shale reserves.

•

Pond Creek-Tug River Group Draws Crowd

The annual dinner meeting of the Pond Creek-Tug River Mining Institute held Jan. 27 in Williamson, W. Va., was attended by 256 members and guests, reportedly the largest attendance in the history of the institute.

Newly elected officers of the institute are: president, M. M. McCormick, superintendent, Fairfax Coal Co., McAndrews, Ky.; first vice president, Rudolph Matney, superintendent, Leckie Collieries Co., Aflex, Ky.; second vice president, Stephen Younger, safety director, Pond Creek Colliery, So. Williamson; and secretary-treasurer, C. D. McDowell, Williamson.

O. W. Evans, general superintendent, N. & W. Ry. mines, was toastmaster at the dinner and introduced prominent guests of the evening, who included A. D. Sisk, chief, Kentucky Department of Mines and Minerals, W. H. Roll, assistant to Mr. Sisk, and a number of state mine inspectors.

Alex U. Miller, chief, Mt. Hope (W. Va.) branch, U. S. Bureau of Mines, gave a brief talk on the progress made in mine safety. Also attending from the Mt. Hope office was E. E. Quenon, and from the Bureau's Norton (Va.) office, W. H. Tomlinson, chief, and M. L. Davis, W. R. Parks, G. E. Reid and W. L. Davis.

R. C. Denny, retiring president of the institute, was presented with an honorary life membership in the organization.

Achievement awards were made to 84 mine foremen and other supervisory personnel for safety records made last year. The Pond Creek Colliery mine of the N. & W. Ry. received the annual safety award as the mine having the lowest accident rate in the institute.

•

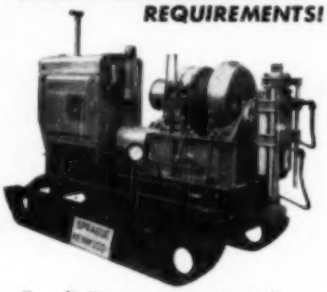
Anthracite Inspection

To clarify his position in regard to anthracite inspection, Michael J. Kosik, president, District 1, United Mine Workers of America, Scranton, Pa., offers the following supplement to the report of his remarks at the 1949 National Safety Congress:

"In the December, 1949, issue, page 173, your account of the meetings of

WHAT ARE YOUR CORE DRILLING DEMANDS ?

SPRAGUE & HENWOOD, INC.
MEETS YOUR INDIVIDUAL REQUIREMENTS!



Core Drilling to *meet your needs*—that is a special advantage of Sprague & Henwood's Core Drilling Machines, designed to perform the work expected of them. They are modern in every respect . . . are engineered to meet the strenuous demands of present day core drilling jobs, . . . and construction enables them to withstand long, rugged service at high speed! Available with two distinct types of swivel-heads: "Screwfeed" and "Hydraulic".

You will profit by the many features offered in Sprague & Henwood's Core Drilling machines. For full details and advantages write us today.

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Are also manufactured by Sprague & Henwood, Inc. . . . full details sent on request.

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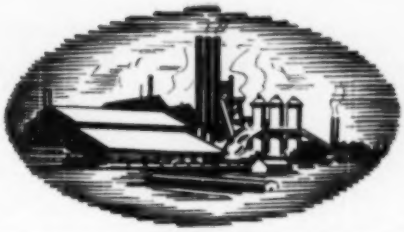

1900 ★ THE MIRACLE OF AMERICA ★ 1950

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America has set an amazing record of progress in 50 years—but a moment in the history of civilization. A record unequalled by any other political or economic system.

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And here's another phase of the miracle that went hand-in-hand with these and the myriad of intertwined technological advances—ranging from the radio telephone and Bakelite to the X-ray tube and teletype . . . and to atomic energy and its untold potentialities.

- Since 1900 we have increased our supply of machine power 4½ times.
- Since 1900 we have more than doubled the output each of us produces for every hour we work.
- Since 1900 we have increased our annual income from less than $2400 per household to about $4000 (in dollars of the same purchasing power), yet . . .
- Since 1900 we have cut 18 hours from our average work week—equivalent to two present average workdays.

How did we do it? The basic cause for this composite miracle has been the release of human energy through FREEDOM, COMPETITION and OPPORTUNITY. And one of the most important results is the fact that more people are able to enjoy the products of this free energy than in any other system the world has ever known.

THIS IS THE MIRACLE OF AMERICA . . . it's only beginning to unfold.

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the National Safety Council held in Chicago, Ill., in the month of October, 1949, contains the following statement reported to be made by me:

'Michael Kosik, president, UMWA, District 1, Scranton, Pa., continuing the open-forum discussion argued that safety is made difficult by foremen who talk safety and tonnage at the same time *and declared that safety would be improved if Pennsylvania state mine inspectors spent less time searching for hidden matches and cigarettes and more time on other safety precautions.*'

"Since the publication of the italicized portion of the statement can and is interpreted to be a reflection on the honesty and sincerity of the anthracite state inspectors, I assure you that it was not made with that intent or for that purpose.

"In making the statement, I did not wish to convey the impression that the inspectors were not honest, sincere and diligent in the performance of their responsibilities and the enforcement of the mining laws.

"For the reasons stated, I wish to file this as a retraction to that part of the statement which I have italicized in this letter. In fairness to all parties concerned, I would appreciate very much if my retraction thereof be given the same consideration in *Coal Age* as did the statement itself."

•

Virginia Bill Would Let State Seize Mines

A bill granting the state peacetime emergency powers to seize and operate coal mines in Virginia has been passed by the state General Assembly. The bill, introduced Jan. 25 by Delegate J. B. Boatwright, was immediately signed by Gov. Battle after its passage last month.

The bill will make specific the powers that Gov. Tuck inferred last year when he seized the mines under wartime emergency powers. The Boatwright bill provides for a three-man control body which could acquire property under eminent domain, operate mines, distribute fuels, issue rules and regulations and employ workers. It further declares that the coal industry is "essential to the welfare of the people of Virginia."

•

Pond Creek Colliery Wins Annual Safety Award

Pond Creek Colliery, Norfolk & Western Ry., Pond Creek, Ky., recently was awarded the annual safety trophy of the Pond Creek-Tug River Mining Institute. The award was made Jan. 28 at Williamson, W. Va., in the presence of over 250 mining men from the area. Lapel pins designating winners were presented to 89 men.

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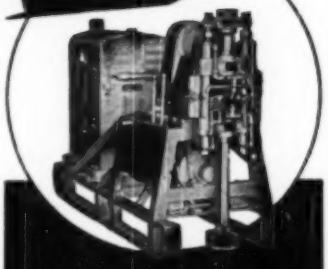

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Foreign Developments

MONTREAL—A royal commission investigating the coal industry in Saskatchewan has recommended continuation of the UMWA welfare fund but urges that payments be made on a payroll percentage rather than by a tonnage royalty. The present fund is financed by a royalty of 3c per ton. Pensions, a separate matter, are financed by contributions from the miners and their company. The union had asked for a levy of 15c per ton.

LONDON—A long-range plan to raise the standards of technical education for skilled men and under-officials in the coal industry has been announced by the National Coal Board and soon will be discussed by representative bodies in the coal industry, education and professional institutions. Aim is to raise the colliery deputy's qualifications, as well as those of foremen, supervisors and skilled workers.

MELBOURNE — The Joint Coal Board plans an experiment in New South Wales looking to the recovery of pillars now left in coal mines. The Coal Board plans to try strip-mine overburden as stowage in pillar sections underground and then to mine the coal from the pillar section by stripping.

•

Mine Maintenance Group Grows in Membership

The Mining Electro-Mechanical Maintenance Association, organized at Pittsburgh, Pa. in the fall of 1948, has grown to a membership of over 800 maintenance men in four local branches in the bituminous mining areas of Pennsylvania, according to a recent report of D. C. Jones, president of the Central Advisory Council of ME-MMA and director of Mineral Industries Extension Services, Pennsylvania State College.

Local branches hold monthly meetings from September to May to discuss maintenance problems that interest men actually engaged in the operation or maintenance of equipment. A program committee of the Central Advisory Council provides programs and speakers at the request of any branch from a list of programs offered by equipment manufacturers and other interested agencies.

Membership is restricted to machine operators, electricians, mechanics and maintenance supervisors. However, associate memberships are open to anyone interested in promoting better maintenance, and patron memberships have been taken by companies allied with the coal industry to support the work of the central advisory council.

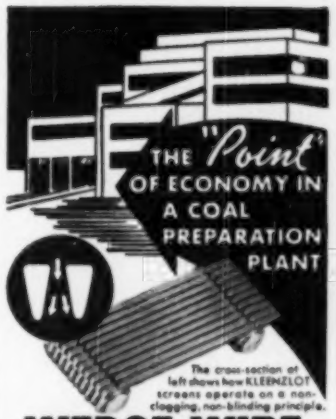
ME-MMA branches organized to date serve the Allegheny River valley, Greene County, Johnstown area and Barnesboro area, all in Pennsylvania. Branch expansion is limited at present to Pennsylvania, eastern Ohio and northern West Virginia.

•

Federal Code Inclusion Sought in Kentucky Bill

A 74-page bill introduced into the Kentucky State Senate Feb. 8 reportedly proposes incorporation of the Federal Safety Code into the state mining laws, along with other steps to generally strengthen them.

In addition to the many changes in safety practices called for, the bill also proposes 25 district mine inspectors, raises their pay from $4,200 to $5,000 and permits them to hold office "during the period of capable efficient service and good behavior." Present law specifies an "adequate number" of inspectors for terms of 4 yr each.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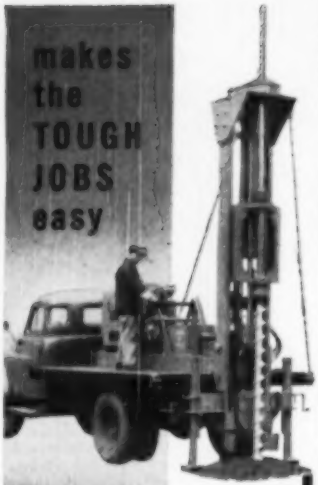

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Senate Hearings Begin On Labor Monopoly Bill

Hearings began Feb. 16 before a Senate judiciary subcommittee on a bill introduced by Sen. Robertson (D., Va.) that would make labor unions subject to anti-trust regulations. Speaking before the committee, Sen. Robertson said the bill had been written after the earlier hearings before the Senate banking and currency committee on unreasonable restraint of trade and commerce by labor organizations.

"The public can be hurt just as badly when restraints are imposed by a labor union as it can when those restraints are imposed by business combinations," Sen. Robertson said. "In fact, no business combination of which I have ever heard has achieved the kind of arbitary power and control that John L. Lewis now possesses and wields.

"In the case of coal, John L. Lewis has been dictating to the industry in such a way as to govern production and prices. If this continues, the whole industry will be run at the discretion of one man. That tends to drive out small business and put the remaining big business under the control of a monopolist. My interest is in the general public and the health of the national economy. I am also interested in the mine workers. They too have been hurt," Sen. Robertson said.

•

Coal Publications

The following may be obtained free upon request to Publications Distribution Section, U. S. Bureau of Mines, 4800 Forbes St., Pittsburgh 13, Pa.:

Underground Transportation in the Ruhr Coal-Mining District of Germany, by R. W. Stahl, H. E. Sanford and J. B. Benson. I. C. 7547. 9 pp plus 6 pp of illustrations. 8x10½-in; paper; mimeo. An account of recent progress, which has been limited in old mines but is notable in newer mines.

Effect of Temperature on Flame-Arresting Properties of Flat Joints in Explosion-Proof Mine Equipment, by R. S. James. R.I. 4639. 27 pp plus 5 pp of illustrations and graphs. 8x10½-in; paper; mimeo. Study of the effect of high temperatures on flame-arresting properties of flange joints, especially in "breathers" for electrical compartments and flame arresters for diesel engines.

Special Equipment in the Coal-Hydrogenation Demonstration Plant, by J. A. Markovits, K. C. Braun, J. T. Donovan and J. H. Sandaker. R.I. 4584. 40 pp plus 45 pp of illustrations. 8x10½-in; paper; mimeo. Description of special high-pressure, corrosive-resistant equipment; engineering fabrication and design problems

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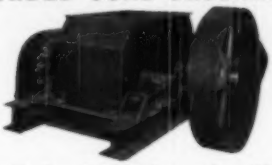

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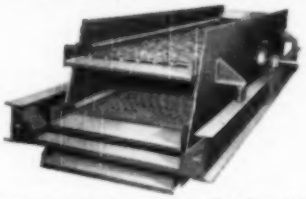

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involved; and summary of experience gained.

A Test of Treated Timbers at a Mine at Negaunee, Mich., by F. S. Crawford and R. M. Wirka. R.I. 4622. 8x10½-in; paper; mimeo. Results of a 20-year cooperative test, showing that treated timbers last two to 2½ times as long as untreated timbers set in the same mine passageway. Preservatives tested were zinc chloride, borax and sodium fluoride.

Washability Study of Coal From a Strip-Pit Bed on the Cumberland Plateau Near Chalybeate, Van Buren County, Tenn., by B. W. Gandrud and H. L. Riley. R.I. 4596. 10 pp plus graphs. 8x10½-in; paper; mimeo. The first Bureau report on washability of Tennessee coals. Data indicate that jigging or tabling would produce a washed coal with about 12.3% ash and 2.07% sulfur. Heavy media separation would reduce these figures to about 10.1% ash and 1.57% sulfur in sizes from 4 to 3/16 in.

Shuttle-Car Tire and Roadbed Study, by R. H. Nicholas, J. S. Whittaker, D. D. Dornenburg, John P. Harmon and Walter Bank. R.I. 4624. 22 pp. 8x10½-in; mimeo. Effects of rough-tread and smooth-tread tires, on road beds, quantity of dust suspended by tires and service obtained by each type of tire.

The National Safety Competitions of 1944-1947, by F. T. Moyer, J. H. Schuster, J. I. Davis and E. K. Elsner. I.C. 7545. 8x10½-in; paper; mimeo. Summary of four years' operation of the "Sentinels of Safety" awards, including a list of all winners 1944-1947 and a summary of injury experience in each participating group since 1923. Groups are: anthracite, bituminous, metal, non-metal and quarrying.

Summary of Published Information on Large-Capacity Compressed-Air Receivers for Underground Mines, by Andrew Allan Jr. I. C. 7541. 8x10½-in; paper; mimeo. Helpful information on storing compressed air underground, especially by use of large chambers which can be sealed off by bulkheads or grouting.

Pressure-Relieving Capacities of Diaphragms and Other Devices for Venting Dust Explosions, by John Nagy, J. E. Zeilinger and Irving Hartmann. R. I. 4636. Reports of tests in a 64-cu-ft chamber with a 13×19-in vent covered by various materials to find ways of venting explosions in enclosed spaces. Tests were made with aluminum dust and coal dust.

The following are available as indicated:

Estimated Original Coal Reserves in New Mexico. U. S. Geological Survey, Washington 25, D. C. Free. Preliminary table showing summary results of an appraisal of coal reserves in New Mexico. Reserves are classi-

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Economics of the Mineral Industry. Quarterly of the Colorado School of Mines, Vol. 45, No. 1A. 47 pp. 6x9-in; paper. 50c, Dept. of Publications, Colorado School of Mines, Golden, Colo. Three papers in mineral-resources, oil and gold delivered at a general conference in mineral economics in Sept., 1949.

Coal, Coke and Coal Chemicals, by P. J. Wilson Jr. and J. H. Wells. Chemical Engineering Series, McGraw-Hill Book Co., 330 W. 42nd St., New York 18. 509 pp. 6¼x9¼-in; cloth. $8. Coal and coal carbonization; preparation, cleaning and storage of coal for coking; coking processes and products; economics of carbonization. Includes a bibliography of source materials on coking, a list of carbonization plants in the United States and a list of visual aids available in the study of coking.

In and Under Britain: The Story of Coal, by M. H. Haddock. Evans Bros., Ltd., London. 250 pp. 5¾x8½-in; cloth. 10/6d. A new revision of a prewar book written especially for grammar, secondary and technical schools. Designed to attract young men to coal mining. Subjects include: origin of coal, ventilation, mining methods, mining geography, lighting, transportation and new machines.

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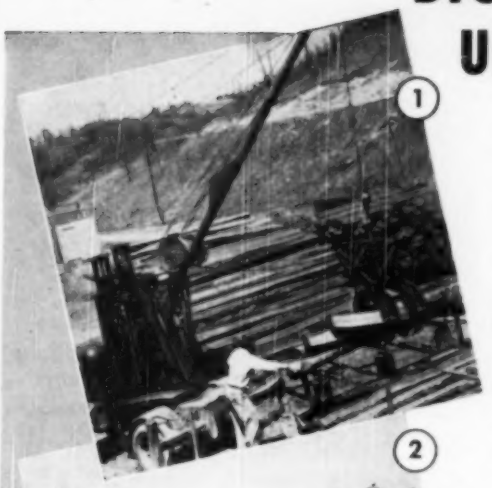

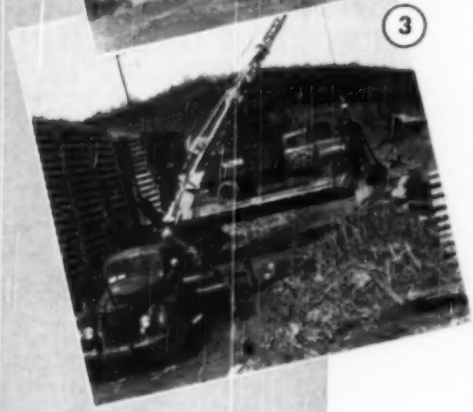

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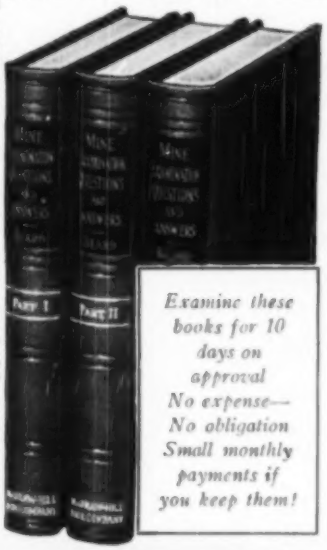

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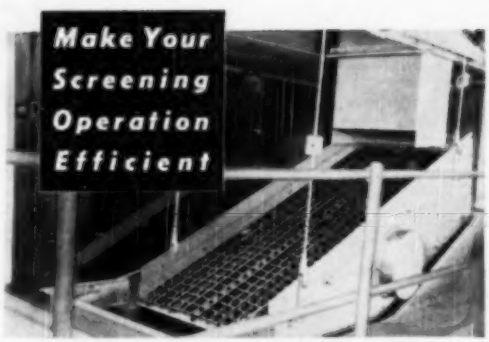

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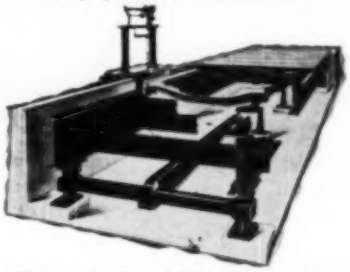

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When you want additional employees, want to buy or sell used or surplus equipment, want additional products to manufacture, seek additional capital, or have other miscellaneous business wants —advertise them in the Searchlight Section for quick, profitable results!

Classified Advertising Division

McGRAW-HILL PUBLISHING CO., Inc.
330 West 42nd Street New York 18, N. Y.

JEFFREY

HAS

DOUBLE OR SINGLE ROLL IMPACT OR FLEX TOOTH CRUSHERS

For Efficient Sizing of Coal or Refuse

Send for Literature

The Jeffrey Manufacturing Company
912 North Fourth St., Columbus 16, Ohio

20 SALES OFFICES

Baltimore 2	Cincinnati 2	Houston 2	Philadelphia 3
Birmingham 3	Cleveland 13	Huntington 19	Pittsburgh 22
Boston 16	Denver 2	Jacksonville 2	St. Louis 1
Buffalo 2	Detroit 13	Milwaukee 2	Salt Lake City 1
Chicago 1	Harlan	New York 7	Scranton 3

Jeffrey Mfg. Co. Ltd., Head Office & Wks.: Montreal

FOR MINES USING

E. K. Campbell Heavy Duty
FURNACE FAN SYSTEMS

- No full-time fireman—**FULLY AUTOMATIC OPERATION!**
- No steam lines to leak or freeze.
- No unit heater cores to leak or motors to replace.
- Low stack temperatures, large air volume, low fuel bills.
- No water supply or purification needed.
- Guaranteed Heating Results, at no extra cost.

The heating system of proven results and economy for preparation plants, garages, shops and all types of mine buildings.

If you have a heating problem, an E. K. Campbell Company engineer will gladly call without obligation. Write today.

E. K. CAMPBELL COMPANY
KANSAS CITY 3, MISSOURI

I wish I had a roof drill that was fast, safe and dependable!

Dooley Bros. are about to make that wish come true. Yes! Another 'first' for . . .

DOOLEY BROS.

1201 S. WASHINGTON ST. PEORIA, ILL.

DB

Specify . . .

DANDUX

BETTER-MADE

BRATTICE CLOTH

Wears Longer!
More ease of handling and efficiency.

Flameproof!
Flameproofed under carefully controlled methods in accordance with Dandux laboratory standards.

Rates High on Job!
Better protection under all working conditions.

Mildew Resistant!
Finest quality yarn more closely woven into strong cloth.

Lowers Costs!
May be hung and used over and over.

Quality Controlled At Daniels Mills!
Carefully tested and checked for uniformity during every step of manufacture.

. . . from your dealer

C. R. DANIELS, INC.

75 West St.
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If you are

Please notify us at least three weeks in advance to insure uninterrupted service to your subscription to COAL AGE. Use the convenient change of address form below and mail to:

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COAL AGE
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Name .....
Old Address .....
New Address .....
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New Title or Position .....

DON'T FORGET TO NOTIFY YOUR POSTMASTER, TOO!

Core Drilling *by Contract*

Exploration for coal and other mineral deposits. Foundation test boring and grout hole drilling for bridges, dams and all heavy structures.

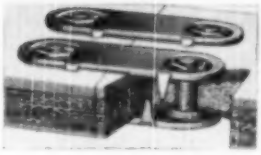
Core Drill Contractors for more than 60 years

JOY MANUFACTURING CO.
Contract Core Drill Division
MICHIGAN CITY, INDIANA

PERFORATED METAL
COAL MINING SCREENS
Manufactured exactly to your specifications.
Any size or style screen, in thickness of steel wanted with any size perforation desired.
We can promptly duplicate your present screens at lowest prices.
CHICAGO PERFORATING CO.
2443 West 24th Place
CHICAGO 8, ILL. VI. 7-6787

FLEXCO®
BELT FASTENERS and RIP PLATES

FOR HEAVY CONVEYOR AND ELEVATOR BELTS OF ANY WIDTH

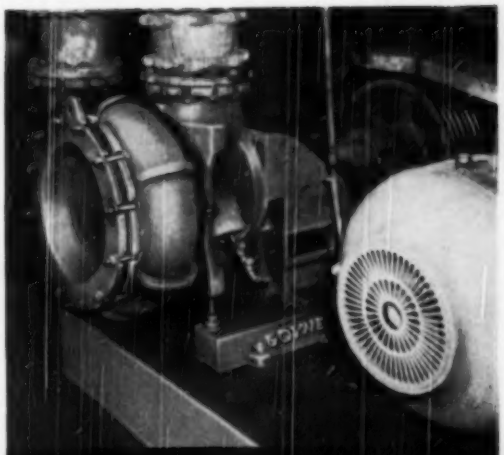


Compression Grip distributes strain over whole plate area

- ★ FLEXCO Fasteners make tight butt joints of great strength and durability.
- ★ Trough naturally, operate smoothly through take-up pulleys.
- ★ Distribute strain uniformly.
- ★ Made of Steel, "Monel," "Everdur." Also "Promal" top plates.
- ★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.

Order From Your Supply House. Ask for Bulletin F-100

FLEXIBLE STEEL LACING CO.
4638 Lexington St., Chicago 44, Ill.



GOYNE
SOLIDS HANDLING PUMP

Feature:
LOW-COST OPERATION

GOYNE SOLIDS HANDLING PUMPS are extremely popular with a very large number of coal companies who find them quite reliable for pumping:

Liquids with solids added to increase specific gravities for coal and refuse separation in coal preparation plants.

Disposing of refuse and silt by pumping to waste material banks or for back filling into mined out areas.

Pumping prepared coal to temporarily desired storage areas.

These specially designed Goyne pumps incorporate numerous features to reduce upkeep and labor maintenance costs to a minimum:

1. Ease of inspection of all wearing parts. All internal portions are immediately accessible after removing *only the rear head of the pump.* No suction or discharge piping or any other major part of the pump is disturbed.

2. The only packing box of the pump is subjected to the low suction pressure rather than to the discharge pressure developed by the pump. This feature assures long packing and shaft sleeve life.

3. Impeller clearance is adjusted while the pump is running, insuring constant pump capacity so essential for uniform washing.

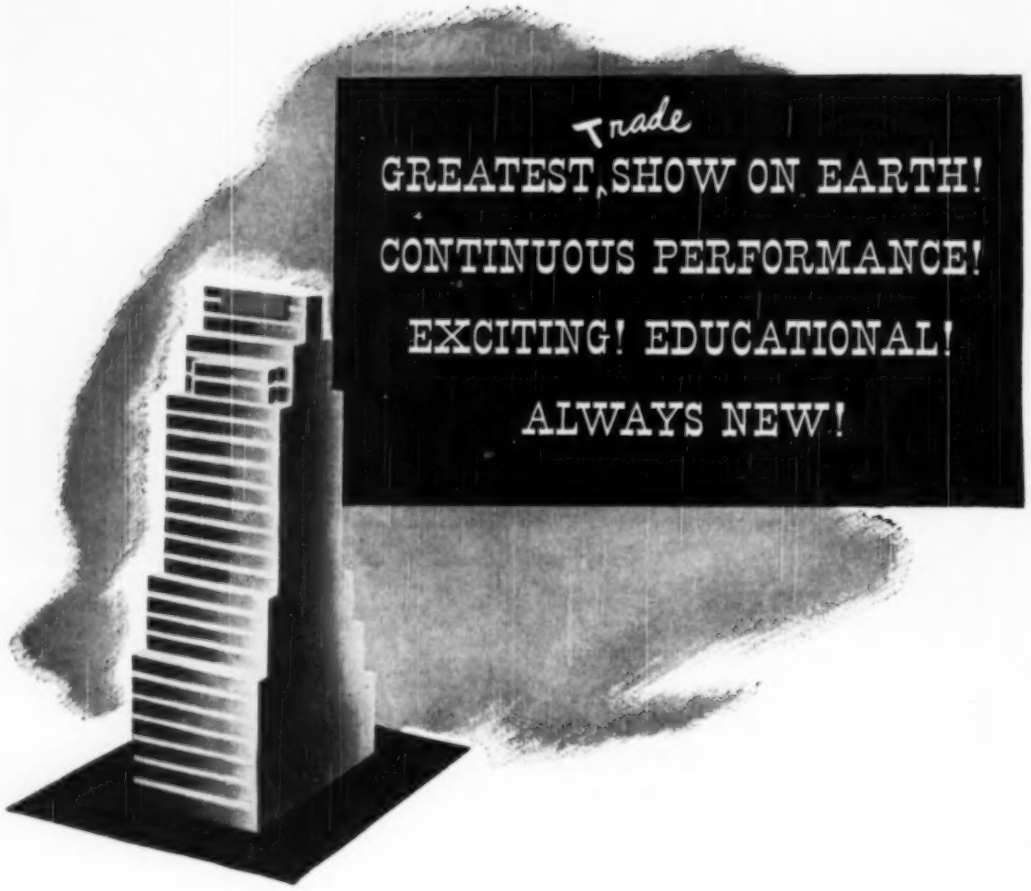
4. There are twenty-eight possible nozzle assembly combinations for each standard pump. Washery designers like this "adaptability feature" as it helps them out of tight places and simplifies piping.

5. Spare parts are carried in stock at our plant for prompt shipment. Reduce your inventory by using Goyne Process Pumps.

All inquiries are given a thorough engineering analysis and our prompt attention.

GOYNE MINE PUMPS 1881

The GOYNE STEAM PUMP CO.
ASHLAND, PA.



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Publishing Company, Inc., 330 West 42nd Street, New York 18, N. Y.

"Sutton" SAND DRYING STOVES

The Standard for Over Forty Years

Burns Any Type of Fuel

The "Sutton" Sand Dryer may be fired with any type of fuel. While most "Sutton" Sand Dryers are equipped to burn coal, they can be furnished with burners for natural gas or fuel oil.

"SUTTON" FEATURES

- Simple in operation
- No skilled labor necessary
- Made in four sizes
- Lowest original cost
- Economical upkeep
- Topmost efficiency

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Catalog and Prices sent upon request

INDIANA FOUNDRY COMPANY

950 Oak Street — Indiana, Pa.

Answering your questions on . . .

Modern and efficient coking practices

Here is a complete and up-to-date description of today's best methods in dealing with coal . . . high-temperature coking . . . recovery of coal chemicals from the coke-oven gas . . . and distillation of tar. Each phase of the industry is systematically covered and other coal-carbonization processes, gas retorts and lower-temperature coking are described. Fuels in general and the principles of combuston are given careful attention. Included is a timely discussion of the economics of the industry and trends in by-product coking.

Just Published!

Coal, Coke, and Coal Chemicals

By Philip J. Wilson, Jr.
Research Associate
Carnegie-Illinois Steel Corp.

and

Joseph H. Wells
Senior Fellow
Carnegie-Illinois Steel Corporation

509 pages • 220 illustrations • $8.00

McGraw-Hill Chemical Engineering Series

THIS comprehensive book covers the coking industry from fuels to economic trends. It goes from the origin, classification and properties of coal through the preparation of coal, the coking processes themselves, and finally the recovery of coal chemicals. Here is a sampling of the scores of topics covered:

- Principal fuels discussed and basic principles of combustion outlined.
- Crushing, mixing, cleaning and storage of coal.
- Different types of byproduct ovens, their methods of operation and heating.
- Preparation of coke for use and principal applications including the blast furnace, cupola, water-gas sets, domestic furnaces.
- Cooling, cleaning, conditioning of gas including removal of tar, hydrogen sulfide, hydrogen cyanide, water vapor, and gums.
- Refining of coal tar and recovery of the principal fractions and individual compounds.
- Low-temperature carbonization processes, and the Curran-Knowles Process.

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Send me Wilson and Wells' COAL, COKE, AND COAL CHEMICALS for 10 days examination on approval. In 10 days I will remit $8.00, plus few cents for delivery, or return the book postpaid. (We pay for delivery if you remit with this coupon; same return privilege.)

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Position C-3-50

(This offer applies to U. S. only)

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$155.00

The Cincinnati
TRADE MARK

ONE-MAN COAL DRILL

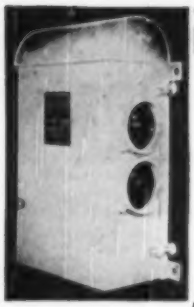
. . . specifically designed and built for drilling coal. Universal motor — operates on AC or DC current. Cuts costs. More power "pound for pound" — more efficiency day after day!

Write today for FREE illustrated bulletin.

THE CINCINNATI ELECTRICAL TOOL CO.

Division of The R. K. LeBlond Machine Tool Co.

2635 MADISON ROAD • CINCINNATI 8, OHIO



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For Main Haulage ● Prevent Collisions
Save Trip Time

A two wire cable connects two or more signals together into one block. Only one signal can show proceed on the entrance of a trip, all other signals show stop.

● Low in Cost.
● Easy to Install.
● Write for Catalog.

NACHOD & UNITED STATES SIGNAL CO.
INCORPORATED
4771 Louisville Ave., Louisville, Ky.

CESCO ELECTRICALLY OPERATED TRACK SWITCH

Thrown by Motorman
Operates Switch Safely ● Saves Time and Money

This modern track switch is thrown swiftly and safely by motormen as they sit in their cabs. It saves time and money, and is fool-proof and dependable!

Over 40 years experience manufacturing
ELECTRIC TRACK SWITCHES

Write for Catalog
CHEATHAM ELECTRIC SWITCHING DEVICE CO.
INCORPORATED
4780 Crittenden Drive, Louisville, Ky.

"We look into the earth"

CORE DRILLING —anywhere!

PENNSYLVANIA Drilling CO.
DRILLING CONTRACTORS AND MFRS.
1205 Chartiers Ave. PITTSBURGH, PA. WAlnut 1-8816

HOFFMAN BROS. DRILLING CO.

Diamond Core Drilling Contractors
Punxsutawney, Pa. · Tel. 382

WE HAVE SPECIALIZED IN TESTING BITUMINOUS COAL LANDS FOR MORE THAN 40 YEARS

GASOLINE • STEAM • ELECTRIC DRILLS • WE PRE-GROUT SHAFT LOCATIONS • HORIZONTAL DRILL HOLES FROM 3" TO 16" FOR DEWATERING MINES • OUR OPERATORS ARE HIGHLY SKILLED

WE HAVE ALWAYS GUARANTEED SATISFACTORY COAL CORES . . . We solicit your inquiries

Westinghouse HYDRAULIC BRAKES

increase efficiency
reduce maintenance

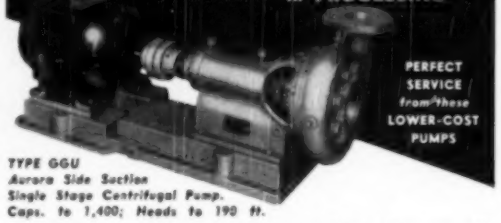
Developed specially for use on small mine locomotives where space won't permit use of air brakes. Give full control of trips at all times, better average speeds with top safety, more accurate spotting of cars. Eliminate motor bucking to slow or stop . . . halt excessive repairs of pinions, broken axles and armature shafts, multiply brake shoe life, decrease wheel turning. Ask for reprint, reporting the results obtained in a Kentucky mine, and for Bulletin SP 9092.

Stocked and Distributed By NATIONAL MINE SERVICE COMPANY
Beckley, West Virginia

Westinghouse Air Brake Co.
Industrial Division: Wilmerding, Pa.

PERFORMANCE *Plus*

wherever liquids are IMPORTANT *in* PROCESSING



TYPE GGU
Aurora Side Suction
Single Stage Centrifugal Pump.
Caps. to 1,400; Heads to 190 ft.

There is a Size and Type of PUMP *"by Aurora" for* EVERY *Pumping Need in* INDUSTRY

Ask for CONDENSED CATALOG "M"

You may count on perfect performance with lasting efficiency when you rely upon this Aurora Type GGU for either important or incidental liquids handling in industrial processing. The casing is separate from the bearing bracket, THEREFORE, the need for special metals to handle corrosives is minimized. Discharge may be placed in any of eight positions. We commend these pumps for high satisfaction and economy.

APCO TURBINE-TYPE PUMPS

For high pressure, small capacity requirements up to 150 g.p.m. Wide operating range characteristics. No metal-to-metal contact. Handles non-lubricating liquids without wear. Only one moving part — the impeller.

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AURORA Always PUMPS
AURORA PUMP COMPANY
92 Loucks Street, AURORA, ILLINOIS

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT BUSINESS: **"OPPORTUNITIES"** :EQUIPMENT :USED OR RESALE

REPLIES (Box No.) Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITION VACANT

UNDERGROUND AND Strip mine operating superintendent for progressive non union combination strip and underground mine located in southwestern old Virginia. Must be capable of layout work, supervision and have a good practical background. References are necessary. Address P2188, Coal Age.

POSITION WANTED

MINING ENGINEER with twenty-five years' experience in anthracite and bituminous mines desires permanent position as mining engineer or supervisor of mechanical mining with progressive company. Can furnish best of references. PW 2232, Coal Age.

BELGIAN REPRESENTATIVE

With twenty years extensive connections in heavy industry—coal mines, steel works, cement works, etc.—desires general representation for Belgian-Benelux for all types of equipment and material in these fields. Now represents Whitcomb-Baldwin Diesel Locomotives. Will be in N. Y. to end of March. Write for appointment and send documentation to:

MICHEL E. WOLFF
318 W. 100 St. New York 25, N. Y.

WANTED:

Modern 4 or 5 yard used electric power shovel. Advise age, Manufacturer, Model, location, price and loading height.

W2067, Coal Age
330 W. 42nd St., New York 18, N. Y.

WANTED

Good used 35 B Jeffrey cutting machine.
18 x 18 single roll crusher (Jeffrey).
8-ton Locomotive.
1—512 Goodman Machine truck.
500-M—CM Cable 3000'.

Mason & Sons Coal Co. Inc.
Coshocton, Ohio

FOR SALE

WINCH TRUCKS—Hendrickson Diesel, 5-Ton—G.M.C. 2½-Ton—Chevrolet 2½-Ton—G.M.C. 1½-Ton—all with oil field beds, headache racks. Tulsa Winches.—A-1 condition, clean, used only in our business.

JOHN FABICK TRACTOR COMPANY
Laclede 8800 ST. LOUIS, MISSOURI L. D. 5

FOR SALE

Belt Picking Table

48"x15 feet. Good condition. Reasonable.

FREEPORT GAS COAL CO.
Box 141 Coshocton, Ohio
Phone—Coshocton 2695

FOR SALE

One Goodman Universal 35 H.P. Permissible 250 volts Standard Goodman truck in A-1 condition.
One 30 B. Goodman Locomotive with reel and cable, 42" gauge, in good mechanical condition, 250 volts.
Two M. R. 96 Jeffrey 4-ton with cable reel, 250 volts, 42" gauge, A-1 condition.
2—Gt'd 50 H.P. Goodman, 250 v. 42" ga., in A-1 condition.
Two 1500 Goodman 3½-ton, 250 volts, in fair condition, with motor driven cable reels.

JOHN DE CORTE COAL CO.
425 Sinclair Ave. Cadiz, Ohio

OTTUMWA HOIST: cylindro-conical, 1" rope groove, hoisting range to 400', 150 HP AC 2300 volt motor, complete with all magnetic controls ready for operation, excellent condition.

SHEAVES: 2—60" wrought iron, deep groove for 1" rope with shaft and bocings, practically new, $75.00 each fob.

RR TRACK SCALE: 100 ton, 50 ft., weighs perfectly, $500.00 where-is, now set up for operation.

LONGWALL CONVEYORS: 2—each 300 ft., complete and in excellent condition.

LONGWALL MACHINES: AC—Goodman and Sullivan CLE and CH8, will sacrifice.

ELMIRA COAL COMPANY
Call W. E. Widmer, Tel. No. 866
Excelsior Springs, Mo.

FOR SALE

New type Crescent Coal Washer, 150 tons per hour. New price $12,000.00. Unused—$10,800.00.

Lima 34 Gas Shovel, used 350 hours, f.o.b. Chattanooga, Tenn.—$9,000.00.

NW-25 ¾-yard Dragline, $7,500.00.

Buckeye 70 Shovel, ¾-yard, unused, $8,500.00.

Reply to:

F. TESTA
925 Citizens Bldg., Cleveland 14, Ohio
TOwer 1-0550, 1-0559

STEEL TIPPLE FOR SALE

The Inland Steel Company, Wheelwright, Kentucky, will offer for sale March 1, 1950, a 700-tons per hour steel tipple, complete with shaker screens, loading boom, crushers and motors. The tipple is equipped to load lump, egg, stoker and nut slack.

The tipple and equipment can be examined by appointment at Wheelwright, Kentucky.

FOR SALE

4—Sullivan CE-7 Ironclad Mining Machines 220 V., 60 Cy., 3 Phase, A.C., 6½ ft. Cutter Bars. Complete with Jack Pipes.

Ratchet Stands, Solid Chain Guides, Cincinnati ½x1 Type Chains, Tip Turn Trucks, Cables, etc.

1—Extra Cutter Head, and
2—Extra Chain Guides, Rebuilt.
1—Extra Rebuilt Unused Stator.

Contact

BILL MARTIN
705 North Bowmen Ave.,
Danville, Ill. • Phone 180

RADIAL DRILLS

4'-12" American Triple Purpose, m.d. on base.
4'-12" Fosdick, gear box.
5' American Triple Geared, 12" col., gear box.
5'-11" Carlton, m.d. on arm, latest.
5'-12" Cincinnati-Bickford, m.d.
5'-14" American Triple Purpose, m.d. on arm.
5' Cincinnati Bickford Full Universal, gear box.
6'-15" American Hole Wizard, m.d. on arm.
6'-15" Carlton, gear box, inclosed head.

ENGINE LATHES

14"x54" centers Lodge & Shipley, m.d., latest.
14"x102" centers LeBlond, m.d. in leg, latest.
16"x10' Hendey Yoke Head, taper.
16"x14' American Geared Head, m.d.
16"x11' Greaves Klusman, m.d. in leg, taper.
18"x48" centers Lodge & Shipley, m.d., taper.
18"x52" centers American Geared Head, m.d., taper.
18"x8' American Geared Head, m.d.
18"x8' Hendey Geared Head, m.d.
18"x8' Lodge & Shipley Selec. Head, m.d.
18"x10' Lodge & Shipley Selec. Head, m.d.
19"x10' LeBlond Geared Head, m.d.
20"x10' bed (60" centers) Monarch Geared Head, m.d., taper.
20"x10' Sidney Geared Head, m.d.
20"x11' Lehmann Geared Head, m.d., taper.
22"x70" centers Greaves Klusman Geared Head, m.d., taper.
22"x12' LeBlond Geared Head, m.d., taper.
22"x16' LeBlond Geared Head, m.d., taper.
24"x10' Greaves-Klusman Geared Head, m.d., taper.
24"x12' Bridgeford Geared Head, m.d., taper.
24"x12' Monarch Geared Head, m.d., taper.
26"x12' Bridgeford Geared Head, m.d., taper.
30"x12'6" Niles-Bement-Pond, m.d., taper.
30" raised to swing 42"x21'6" American Geared Head, m.d., taper, Tinkher.
32"x12' Lehmann Hydratrol Geared Head, m.d., taper, latest.

MILLING MACHINES

No. 1M Cincinnati Plain, m.d.
No. 2H Brown & Sharpe Plain, m.d., latest.
No. 2 Cincinnati H.S. Dial Plain, m.d., latest.
No. 2 Rockford Plain, m.d.
No. 2HL Milwaukee Plain, m.d., latest.
No. 3 Cincinnati H.S. Dial Plain, m.d., latest.
No. 3 Standard Cincinnati Plain, m.d.
No. 3H Brown & Sharpe Plain, m.d., late.
No. 3 - 6 Kempsmith Matt Miller, m.d.
No. 4 Cincinnati Plain H.P., m.d.
No. 5 Cincinnati Plain, rect., vertcal, m.d.
No. 2A Brown & Sharpe Universal, s.p.d.
No. 2 Cincinnati Medium Speed Dial Universal, m.d., latest.
No. 2M Cincinnati Universal, m.d.
No. 4A Brown & Sharpe Universal, m.d.
No. 4 Cincinnati H.P. Universal, m.d.

THE EASTERN MACHINERY COMPANY
1013 Tennessee Ave., Cincinnati 29, O.

1—Model 39-A Marion Dragline excavator, 85 feet long boom, 2½ cu. yd. bucket.

1—Model 40-A Marion Dragline excavator, 90 feet long boom—2½ cu. yd. bucket.

1—Lima heavy duty gasoline shovel—1¼ cu. yd. bucket.

1—Bucyrus-Erie Dragline excavator, class 320-B, Shop #4376, electric motive power.

1—Caterpillar tractor—No. 40, equipped with road builder blade used as bulldozer.

P. O. BOX 29
SHENANDOAH, PENNA.

200 KW Allis-Chalmers Rotary—275 Volts D.C. 3/60/155 Volts A.C.—1200 RPM.
250 KW Gen. Elec. M. G. Set—230 Volts D.C.—3/60/440 Volts A.C.—1200 RPM.
300 KW Westgh. 250 Volt Rectifier Complete—New, never been used.
400 Ton Hydraulic Wheel Press—48" between Tie Bars.

ARTHUR S. PARTRIDGE
St. Louis (1) Mo. 811 Olive St.

FOR SALE

CRUSHERS

1—20x30 United Iron Works single roll crusher.
1—24x40 McNally Pittsburgh double roll crusher.
1—30x60 Link Belt double roll crusher.
1—40x54 Jeffrey single roll crusher.

HOISTS

1—Ottumwa Iron Works conical drum hoist, serial #5143, weight 35,000#, 1¼" rope, complete with remote control and hydraulic brake. Direct connected to GE 200 HP motor, model #CD647, type TPC-5617, form M 3/60/2300V, 870 RPM, 73½ amps, 370 secondary amps, complete with automatic switchboard.

1—Ottumwa Iron Works, single rigid cylindro-conical drum hoist, serial #4088, weight 42,000 lbs. 1¼" rope, complete with remote control and hydraulic brake direct connected to Western Electric 100 HP motor, model 17618, type MP-504-10-150-720, form B, 3 phase, 60 cycle, 440 volts, slip ring, secondary volts 388, amps. 187, secondary amps. 183, speed full load 700, serial #4543312, continuous 40° C. Complete with controller and resistance.

1—Ottumwa Hoist #3561, drum diameter 48", face 36", face grooved for 1" rope, equipped with pawl brake 84" diameter, hand operated, single reduction cut spur gears, 19 tooth and 198 tooth, 1¼" pitch, 16" face drum shaft 7" diameter, drum shaft bearing 7"x14", pinion shaft bearing 4½"x18" of the ring oiling type.

LOCOMOTIVES

1—12 ton Goodman ball bearing locomotive, 42" gauge, type 36B-G-4-T.
6—6 ton Goodman ball-bearing locomotives, 30" gauge, type 32-AO6T.
1—6 ton Goodman ball bearing locomotive, 42" gauge, type 32-AO-42.
1—6 ton Westinghouse locomotive, 30" gauge, Class 4 T-85 C 437.
1—6 ton Jeffrey locomotive, 42" gauge.
6—6 ton GE ball bearing locomotives, 42" gauge, class EMT6MM11 with HM821-A motors.
1—6 ton Whitcomb Battery locomotive, 30" gauge.
2—6 ton Goodman ball bearing locomotives, 30" gauge, type 02 I 6 T. (with or without gathering rails.)

MINING MACHINES

1—12AA Goodman DC Universal mining machine, 30" gauge, 6½ ft. cutter bar.
6—CLES, AC, 3 phase, 60 cycle, 230 volt, Sullivan longwall mining machines.
1—Jeffrey Shortwall Mining Machine, Si BB, AC, 6' cutter bar complete with tip tarn truck, cable and reel.
1—Sullivan Shearing Machine, Class CH11, DC, 9' cutter bar.
2—Sullivan Longwall Mining Machines, type CH9, 3/60/220 volts, 30" cutter bars.
1—Sullivan shearing machine, class CH 11 AC.
1—12AA Goodman mining machine, 50 HP, 42" gauge.
2—Goodman Standard mining machines, 50 H4P, 3/60/ 220 volts, 42" gauge.

MOTOR GENERATOR SETS

1—90 KW GE motor generator set type CD 123, form A, comp wound, 327 amps, 280 volts no load, 275 volts full load, 1200 RPM, cont. 50 deg. cont., #1539906 direct connected to 125 HP GE syn. motor type TH, form FK, frame 7354, 2/60/2300 volts, 1200 RPM, 27.6 amps. cont. 60 deg. cont. Excitation 250 volts, 6.8 amps. .76 PF, #4314971, complete with switchboard.
1—200 KW Ridgeway syn. motor generator sets, 2300 volts AC, 1200 RPM, 250-275 volts DC, complete with switchboard, one has brand new GE automatic circuit breaker.

RAILS

Truckload and car lots of good second hand 16, 20 and 25 lbs. rails.

Carload lots new 12 lb., 16 lb., 20 lb., 25 lb. and 30 lb. rails. Price and delivery information upon request.

ROTARY CONVERTERS

1—200 KW Westinghouse Rotary Converter complete with transformers and switchboards.

ELECTRIC DRILLS

2—Dunlap AC Electric coal drills, also 672 phase, 60 cycle, 220 volts.
3—Dunlap Electric coal drills DC.

COPPER

Several hundred feet used 500,000 CM Weatherproof stranded copper.
Several hundred feet used 500,000 CM Bare stranded copper.
Several thousand feet used 4/0 Figure 8 trolley wire.
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1,000 feet 2/0 3/Conductor rubber covered cable—used.
Several thousand feet of used 6/0 Figure 8 trolley wire.
Several thousand feet used 3-Conductor No. 2000 volt cable.
Several thousand feet used 350,000 CM Cable.

TIPPLE

1 Steel tipple complete with shaker and concrete silos. Capacity 1,000 tons per day.

DUCKBILLS

12—G20 Goodman Duckbills Complete, AC.
2—G20 Goodman duckbills, DC.

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6—6 BU AC Jeep Loaders, 3/60/230 Volts.

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200 All Steel Timken Roller Bearing Mine Cars. Overall height 3' 10". Overall length 7' 6". Overall width 6' 5". Wheelbase 3' 5". 42" gauge, 14" Timken Roller Bearing Wheels.
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1—10 T JEFFREY 250 V. MH-110 44-32" Ga.
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1—8 T WEST. 250 V. ML-904C 44-36" Ga.

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1	300	G. E.	1200	600
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200	Westg.	SK-210	500
175	G. E.	MD	440
150	Westg.	SK	500
125	G. E.	CD	600
125	Century	drip proof	1800
100	Westg.	SK-100	500
100	Westg.	S	435
75	G. E.	CDM	1800
60 NEW	G. E.	DC—splash proof	650
40 NEW	Westg.	SK-103	850

D.C. Generators—250-275 V.

KW	MAKE	TYPE	SPEED
250	Westg.		1200
200	Westg.	SK-210	600
150	Westg.	SK	600
110	Westg.	SK-100	790
100	Westg.	SK	730
100	Westg.	S	850
100	G. E.		900
75	Allis Chalmers		720
75	Westg.	S	850
75	Allis Chalmers		850
60 NEW	G. E.	CD	1150
40 NEW	Westg.	SK-103	1150

MG SETS—230/275 V. D.C.

KW	MAKE	RPM	VOLTS	TYPE
200	Westg.	1200	2300/4160	Ac Ind.
200	Westg.	1200	250/440	AC Syn.
150	Burke	900	2300	AC Syn.
100	Westg.	900	2300	AC Syn.
100	Delco	1200	250/440	AC Syn.

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No.	KVA	Make	PRIMARY	Sec.
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1	200	G.E.	2400/4160Y	240/480
3	150	West.	2400/4160Y	240/480
3	150	Pgh.	2300	230/460
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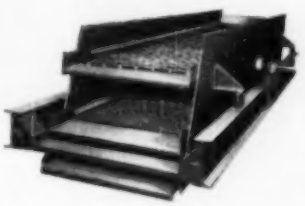

100 machines in stock; screen sizes 2' x 5' to 5' x 14'; 1 to 5 decks. Positive throw eccentric shaft types; also eccentric weight types.

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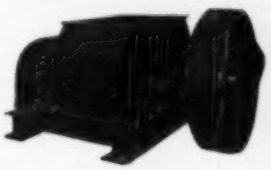

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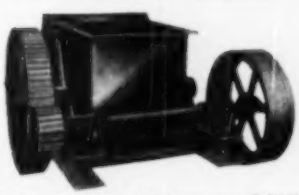

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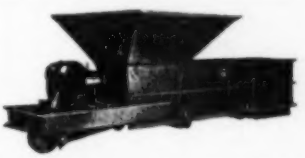

15 to 35 tons per hour capacity $150.00
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Mounted on rubber tires and adjustable undercarriage. All welded structural and sheet steel; double guided heavy duty chain; steel flights to 6" x 36". Electric or gasoline power. Priced from $450.00.

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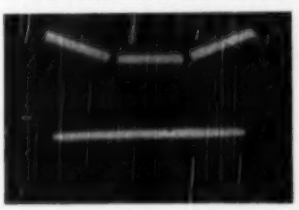

All steel. Interchangeable with other well known makes. Replaceable precision ball bearings with alemite fittings. No bearing adjustments required. Easy to start and will run in cold weather. Rust-proof ball races; maintenance is negligible. Build your own conveyors: we have standard sections, head and tail pulleys, take-ups, drives, idlers, speed reducers, sheaves, belting, etc.

3-roll Troughing Idlers for these sizes:

14" belt	$16.50	24" belt	$21.00
16" belt	16.00	30" belt	25.00
18" belt	30.00	36" belt	30.00
42" belt			$34.00

1-roll Return Idlers for these sizes:

24" belt	$8.25	36" belt	$ 9.75
30" belt	9.00	42" belt	10.50
48" belt			$11.25

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15 Ton Truck Scales	$450.00
20 Ton Truck Scales	510.00
25 Ton Truck Scales	560.00

Others to 50 ton capacity. All scales complete with structural steel weighbridge. New parts and new weighing beams for all makes of motor truck scales.

More than 3000 mines and quarries have modernized with Bonded equipment.

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Phones: Garfield 2186; University 2832; Douglas 2438.

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FRANK J. WOLFE SHELDON J. WOLFE

LATE TYPE CUTTING MACHINES, 250 VOLT DC

8—Jeffrey 29-U Permissible Type Track Cutters.
3—Joy 7-AU Permissible Type, Universal.
3—Goodman 212-AA Low Vein.
7—Goodman 112-AA Universal.
16—Jeffrey 35-BB Permissible Type.
9—Jeffrey 34-L Late Type Longwall.
4—Sullivan 10-B Low Vein.

LATE TYPE CUTTING MACHINES, 220/440 VOLT AC

8—Goodman 12CS on Tip Turn Trucks.
3—Goodman 112GA.
4—Goodman 512CLS on Tip Turn Trucks.
5—Sullivan 7-B on Tip Turn Trucks T-8.

LOADING MACHINES, 250 VOLT DC

8—Joy 14-BU.
6—Joy 9-BU.
11—Joy 7-BU.
6—Joy 11-BU.
5—Joy 12-BU.
6—Jeffrey L-400.
3—Jeffrey L-500.
3—Jeffrey L-600.
5—Goodman 480.
2—Goodman 500.

LOADING MACHINES, 220/440 VOLT AC

4—Joy 8-BU, new in 1946 and 1947.

LOCOMOTIVES, 250 VOLT DC, BALL BEARING MOTORS

2—15-ton Goodman, Type 36-A04C.
2—15-ton General Electric, Type HM820.
3—15-ton Jeffrey, Type MH110.
3—13-ton Westinghouse, Type 988C.
3—10-ton Goodman, Type 34-B.
5—10-ton Westinghouse, Type 907C.
5—8-ton General Electric, Type HM819.
4—8-ton Westinghouse, Type 905C.
4—8-ton Goodman, Type 32A14T.
4—4-ton General Electric HM821.

BATTERY LOCOMOTIVES

10—7-ton General Electric, Type 603-B, with good Exide Batteries.

SUBSTATION EQUIPMENT

150 KW, 200 KW, and 300 KW Late Type Motor Generator Sets and Rotary Converters, equipped with switchboards and all necessary switchgear.

BELT CONVEYORS

1—Joy LaDel 36" Belt Conveyor, 5000' centers.
1—Joy LaDel 20" Belt Conveyor, 3000' centers.
Both Belts are practically new, complete with drives, head and tail sections, idlers and all necessary appurtenances.

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6—Jeffrey type L-500 Loaders.
1—Goodman type 724-EJ Top Cutting Machine, double bar.
1—Goodman type 724-EJ Top Cutting Machine, single bar.

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1—3-Track Steel Tipple with McNally Pittsburg Coal Washer good for 90 tons 3per hour. Bargain for quick sale.

Many other items of equipment to offer, e.g. Tipples, Mine Cars, etc. Mail us your inquiries. Will pay cash for any good equipment you have to sell. Send us your list.

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3—500 KVA G-E 2400-240/480
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3—333 KVA G-E 33000-2300/4000Y
3—333 KVA G-E 13800-120/240
3—333 KVA G-E 13800-230/460
3—333 KVA G-E 11000-2300/4000Y
3—333 KVA G-E 2460/4160Y-240/480
1—250 KVA G-E 6900/11950Y-230/460
3—200 KVA G-E 6900/11950Y-230/460
3—200 KVA G-E 6600/11430Y-2300
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3—150 KVA G-E 11000-2300/4000Y
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3—150 KVA L-M 2400/4160Y-120/240

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1—HO Jeffrey Chain Conveyor.
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1—50 HP Goodman Standard New 5' Bar & Chain.
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Air Compressors—Track Mounted.
500,000 CM—1,000,000 CM Feeder Cable.
9 Section Trailey All Excellent.
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Complete Machinery for Tipples, 3 & 5 Track.
40 New—40 Used End Dump Mine Cars—48" Ga. Low Vein.
New Link Belt Vibrators, 6'x12' and 3'x16'.
Steel Mine Ties, 44" & 48" Ga.—25# and 40#.
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SUBSTATIONS:
Motor Generator Sets, Rotary Converters.
SPARE ARMATURES:
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MOTORS:
D.C. and A.C., 3 Phase.
1—Synchronous 145 H.P., 900 RPM, Western Electric type ATA12-1150 440 volt, can be rewound—direct connected exciter.
TRANSFORMERS:
3 phase and single phase, also rotary.

NEW and REBUILT STORAGE BATTERY

LOCOMOTIVES

1½ to 10 Ton 13" to 56" Track Gauge.
GREENSBURG MACHINE CO.
Greensburg, Pa.

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COAL MINE EQUIPMENT
NORTON, VIRGINIA
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GUYAN MACHINERY CO. — **LOGAN, WEST VIRGINIA**

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Colstrip, Montana

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TOUGH COVERS — Heavy duty, specially compounded abrasive resistant rubber covers having high tensile strength. Thoroughly capable of withstanding the abrasive action of bulk materials. Properly vulcanized to the carcass to assure utmost performance, economically.

STRONG CARCASS—Constructed of finest quality 28 and 32 ounce tough cotton duck, properly treated and impregnated to avoid mildew from moisture and atmospheric conditions. Each ply thoroughly embedded in rubber to prevent ply separation.

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Avoid delays in your production schedules!

We carry in stock for your immediate requirements, Conveyor Belting in widths from 8 inches to 48 inches.

Width	Ply	Thickness Top Cover	Thickness Bottom Cover	Type of Duck Carcass
8"	4	1/16"	1/32"	28 Oz.
10"	4	1/16"	1/32"	28 Oz.
12"	4	1/16"	1/32"	28 Oz.
14"	4	1/16"	1/32"	28 Oz.
16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
36"	6	1/8"	1/16"	32 Oz.
42"	5	1/8"	1/16"	32 Oz.
48"	8	1/8"	1/16"	32 Oz.

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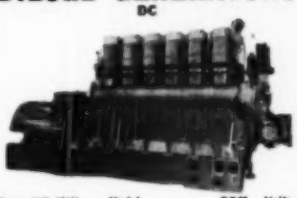
DC



Quan.	HP	KW	Model	RPM	Volts
*2	450	300	Enterprise DSG-6	450	120/240
1	365	250	Ingersoll Rand 6	600	250
1	225	150	Ingersoll Rand 6	900	250
**6	152	100	Superior GDB 6	1200	120/240
3	150	100	General Motors 3-268A	1200	120/240
*2	90	60	General Motors 6-71	1200	500

*NEW.
**Low price on "as is" basis.

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USED COAL PREPARATION PLANT

Built by McNally Pittsburg Mfg. Corporation, Capacity 250 t.p.h. Washed coal, five track, McNally-Norton Wash Box and Settling Cone. Immediate Possession, Pittsburg, Kansas.

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PERMISSIBLE MINING MACHINE BARGAIN, New, never used. Jeffrey 7½' Cutter Bar, 35BB Frame, for LOW VEIN, with low vein truck, 42" ga., 220 volt Alternating Current, 3-phase $6,500.00

200 Ton Portable Hydraulic Press, hand pump, 2-speed, will operate any position, with extensions to handle about 20' shafts, new but only half price $900.00

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One of the largest and most complete stocks in U.S.A. of explosion proof motors, motor control, disconnect switches, and wiring supplies. Immediate stock delivery. Also standard AC and DC motors and control, 1 to 1000 HP.

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Electrical Equipment Coast to Coast

FOR SALE

225 HP Busch Sulzer 150 KW diesel engine generator set.

30 ton American steel stiffleg derrick. 100 foot boom.

100 ton Baldwin diesel electric switching locomotive.

30 ton Orton locomotive crane, diesel powered, built 1942.

150 HP portable firebox boiler. ASME Code. 250# steam presure.

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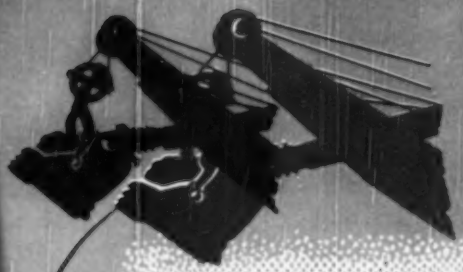


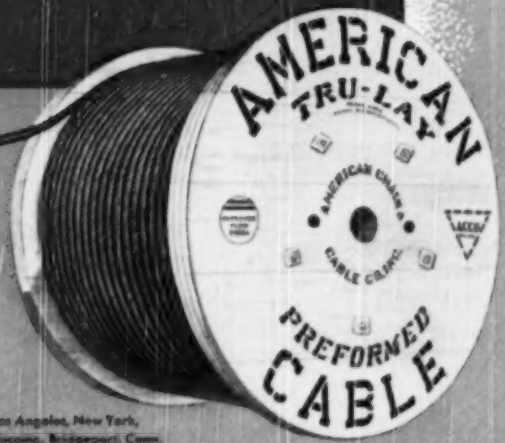
TRU-LAY

. . . all you need to remember about QUALITY

You can specify the Size, Grade and Construction of wire rope with figures and symbols. But the only way to specify Quality is by name—the name that represents the manufacturer.

Tru-Lay Wire Rope is preformed. Moreover, it's made by the originators of the preforming process—pioneers in the wire rope field—men who have spent years finding ways to improve wire rope so that it will serve better and longer.

To make sure of high quality in the wire rope you buy or specify, you need remember only one name—TRU-LAY.



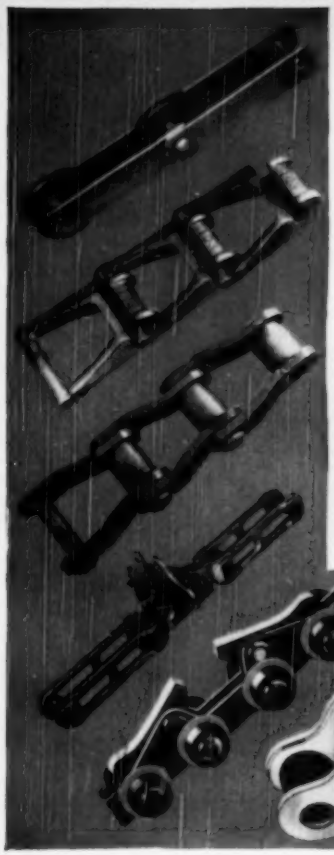
ACCO

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Seattle, Tacoma, Bridgeport, Conn.

AMERICAN CHAIN & CABLE
AMERICAN CABLE DIVISION

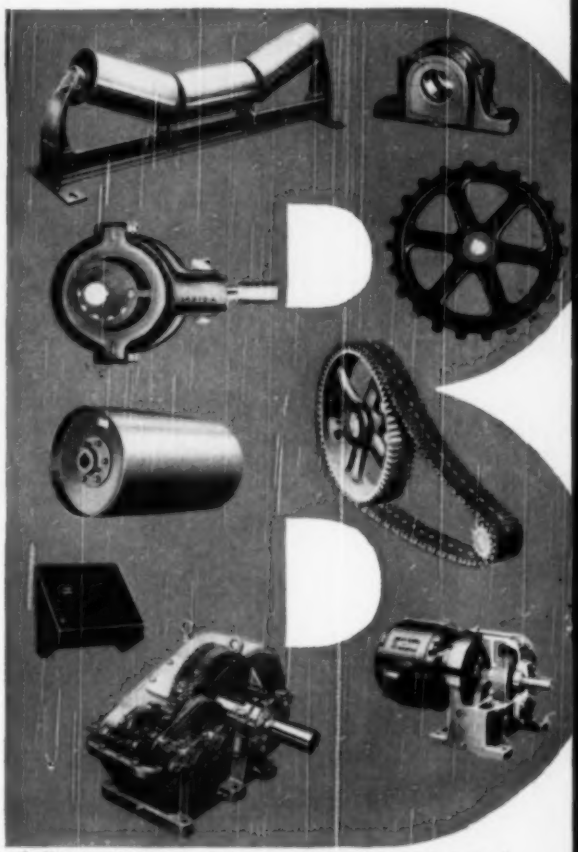
In Business for Your Safety

Link-Belt Conveyor and Power Transmission Components also cut operating costs . . .



It pays coal operators to get genuine Link-Belt replacement products for preparation plant equipment. It pays also to insist on Link-Belt components as original equipment on coal preparation and mining machinery.

On chains, for example, Link-Belt manufactures a suitable chain and sprocket for every conveying, elevating and power transmitting service. In addition to the standard Link-Belt line of malleable, Promal and steel chains, we furnish chains of corrosion, abrasion and rust-resisting alloys for wet coal and refuse elevators and conveyors.



Link-Belt replacement items also include power transmission products such as: ball and roller bearing pillow blocks and take-ups, gears, enclosed gear drives including the P.I.V. Variable Speed Drive, Gearmotors and Electrofluid Drives, roller and silent chain drives, friction clutches and pulleys. Also elevating and conveying parts such as: chains, flights, elevator buckets, Helicoid and sectional flight screw conveyor, belt conveyor pulleys and idlers, conveyor aprons, undercut gates, eccentrics, etc.

And of course we specialize in complete coal preparation plants for which we have designed and furnished hundreds over the country. Why not get in touch with our nearest office?

11,608 **LINK-BELT COMPANY** Chicago 9, Philadelphia 40, Pittsburgh 13, Wilkes-Barre, Huntington, W. Va., Louisville 2, Denver 2, Kansas City 6, Mo., Cleveland 15, Indianapolis 6, Detroit 4, Birmingham 3, St. Louis 1, Seattle 4, Toronto 8.

COAL PREPARATION AND HANDLING EQUIPMENT

Engineered and Built *by* LINK-BELT